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DIVINE HYGIENE

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DIVINE HYGIENE

SANITARY SCIENCE AND SANITARIANS OF THE SACRED SCRIPTURES AND MOSAIC CODE

BY

ALEXANDER RATTRAY M.D. (EDIN.)

"That Thy way may be known upon earth; Thy saving health among all nations" (Ps. lxvi. 2.)

VOL. I

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DEDICATION

To the Memory of my

beloved Wife

PREFACE

The birth of the present book dates back to the year 1878 and the selection of a theme for a Church lecture. The germ idea and this culminated in the publication in 1879 of the volume "Bible Hygiene by a Physician." The manuscript had previously been submitted to two friends: one a learned Divine and poet, the Rev. E. O. Flagg, D.D., of New York City and the Anglican Church of America, to testify to its theological orthodoxy; and the other, a devout and skilled physician, the late Henry Hales, of Reigate, England, to do the same for its medical soundness. The volume had great critical press success: its object being mainly fivefold, namely, to shew:—

1st. What a deep mine of most important medico-hygienic information the Holy Bible is.

2nd. To prove that this is directly or indirectly Divine; and neither an emanation from Moses, nor subsequently interpolated.

3rd. Also that the profundity, value, and Divinity of the Scriptural sanitary hints are nowhere more evident than in their earliest and most ancient portions—the Sinaitic or so-called "Mosaic" law, which came direct from Jehovah.

4th. To point out what a super-eminent, specially evolved and Divinely-led genius Moses was; not in one but in all of the many departments included in the comprehensive Sinaitic law; and in none more than the medical.

5th. To assign Moses his proper place regarding that invaluable and supernal bequest—the Sinaitic law: a production designed, codified, and revealed personally by Jehovah at Sinai; Moses being merely its receiver, transcriber, teacher, utilizer, and transmitter to future generations: a rôle for which he was specially endowed, selected, educated, and instructed in hygienic matters by the Supreme. This just estimate no candid mind can construe into deifying the man at the expense of his Maker. Especially when for the whole; the invaluable Sinaitic law; its multi-gifted human recipient; and his unique rôle, we, as did Moses himself, ascribe the entire glory, honour, and praise to their Divine Donor.

But the Bible mine is deep. Under continued study, during the oft-interrupted moments of a busy professional life, the subject grew. It was also made to include a synopsis of that part of the Scripture hygiene which is especially Divine, as it is given in the very words of Jehovah; and forms a central and integral part of the Mosaic code. Thus it became the present considerably larger publication; meant for a wider range of readers. Scripture has been made to interpret Scripture in preference to human opinions. "What the Lord saith that will I speak" (Numb. xxiv. 13); the object being to ascertain what the Supreme Sanitarian thinks and what "the mind of the Lord is" (Rom. xi. 34). Even the thoughts of wise men are "vain" (1 Cor. iii. 20). Mankind naturally and wisely prefer a true interpretation; especially Jehovah's own rendering of His immortal and invaluable hygienic guide-book. God is the best exponent of His own hygienic laws, forces, and methods.

For anyone, especially a layman, to criticize the Holy Scriptures seems akin to approaching the Ark of old (1 Chron. vi. 9). And therefore each law, thought and word herein quoted has been carefully and prayerfully weighed, in view of the threefold penalty for adding (Deut. iv. 2; Rev. xxii. 18); diminishing (Deut. iv. 2; Rev. xxii. 19); or wresting and mis-

construing (Ps. lvi. 5; 1 Tim. vi. 3; 2 Tim. ii. 15-16); the words of the Book of God and its commandments.

So far as I am aware "Bible Hygiene" was the earliest treatise on the subject. The present elaboration has been made as far as possible, exhaustive. As will be seen from Chapter 1st, the following synopsis of the Divine hygienic methods is only a fractional part and one of the many branches of most important, valuable, elaborate, and comprehensive educational information bequeathed to humanity by the Divinity in His most Holy Word. But even if it stood alone, it clearly furnishes another distinct proof, among many, of the wisdom, beneficence, and care of the Almighty for our race individually and collectively: and suggests that in return it is impossible for us to love Him too much, serve Him with over-zeal, devote ourselves too deeply to religion, or be too grateful to our Divine Benefactor for His Holy Word, which thus "testifies of God" (John v. 39) by its hygiene, as it also does in so many other ways; and permits His "saving health" to be known to all people (Ps. lxvii. 2).

I desire to thank the Rev. Eugene Bourne, Vicar of Dunstan, Lincoln; the Rev. E. T. Glasspool, Vicar of Garthorpe, Leicester; and the Rev. Mr. Dunk, of Boscombe, for the free use of their libraries: and first and above all Him who suggested the theme and instilled the ideas, for graciously permitting an all-unworthy disciple to complete this labour of love. To His care I commit this tribute of a medical man to Bible truth and Christianity: and to Him alone be all the praise (Ps. l. 7-12; lx. 11; Is. lv. 11; Phil. ii. 3; 2 Tim. ii. 15-16; 1 Pet. iv. 7). Lest I should be deemed afraid to acknowledge my views or desirous of making others responsible for them, I have appended my name, in deference to the suggestion of the late Professor Piazzi Smythe, Astronomer-Royal for Scotland, and author of "Our Inheritance in the Great Pyramid."

THE AUTHOR.

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CHAPTER I

THE DIVINE EDUCATION OF MAN

"The Lord is a God of knowledge" (1 Sam. ii. 3). "Shall any teach God knowledge" (Job xxi. 22). "It is God that teacheth man knowledge" (Ps. xciv. 10).

Jehovah in His unique educational revelation—the Holy Bible sees fit to shroud in mystery and enlighten man but very little regarding the Eternity of the past, either during its Pre-creative or Post-creative periods, especially the former: for inferentially the first verse of Genesis gives only a glimpse into a still more remote or pre-creative period in the Divine life when nothing existed but the Triune God Himself, up to the period of the "beginning" when He resolved on beginning His stupendous work of Creation; an epoch when the Triune Deity existed alone, and had not commenced the countless celestial biological or physical emanations of the future, and not even an Angel, Archangel, or Cherub yet had a being. The great Creator and incarnation of all that is good, wise and loving, does not reveal everything even to His Holy Angels (1 Pet. i. 12); and sinful humanity is only permitted to know in part (1 Cor. xiii. 9). He accordingly condenses the stupendous story of Creation, that must have taken countless lengthy periods of our time to elaborate into these ten words, "In the beginning God created the Heavens and the Earth," a comprehensive sentence, yet astronomically and geologically vague, and evidently meant mainly to inform us, *first*, Who is the true Author of all things: *second*, that Earth and Man are only an integral portion of the infinitely vaster celestial development: *third*, that they are not the centre of creation: and *fourth*, by no means its most important part. The story of the evolution of our World is detailed at considerably greater length (Gen i.), doubtless because of much more interest and import to mankind,

and to indicate inferentially the excessive care taken by the Deity to elaborate not only our Earth-house, but, doubtless, also other, or perhaps all, orbs for the occupation of living beings or things in His doubtlessly marvellously varied creative conceptions. The record of the creation of the initial pair of humankind, a matter to us of great and indeed absorbing interest (Gen. i.2) follows, and merges into the story of their progeny, that runs like a thread through the entire šacred volume, being so recorded, chiefly for our tuitionary enlightenment and disciplinary purposes. Man was created and placed on this Planet to be trained for God's service. And, though God the Creator's beneficent and far-reaching plan was marred by Satanic craft and human weakness, it is pleasant to find, from Divine revelation, that the Deity has neither cast us off nor relinquished His original scheme, but still takes supreme interest in and does all He can to promote our welfare and happiness. We find proof of this everywhere and in countless forms. Among the most important of these is a lavish and free gift of knowledge, and educational capacity and facilities for acquiring it. God's purposes required not only Divine Aid and Education but also human acquiescence. The Creator and Created had each to help. The human infant begins life gifted with a still immature brain, undeveloped intellect and blank mind. As generations come and go each new being has to be taught afresh the same lessons of life and conduct; and given the same initial information and training for their individual mission. With Divine forethought, therefore, the Deity met this by providing each person with a special educational equipment; and supplying the race with the very knowledge we most need to perform our new function. God's service and human ignorance are incompatible. It requires information and teaching of a special Divine kind; which opens not only the physical but also the mental, moral, social, and spiritual eyes to receive and profit by this enlightenment. It is not mere worldly but also, and mainly, heavenly wisdom that man requires; and of a sort that is likely "to give light to them that sit in darkness and in the Shadow of Death, and to guide our feet into the way of peace" (Luke i. 68). For this, humanity requires a comprehensive education; including that not of the intellect alone, but of the entire entity, body, brain, heart and soul. To promote this the Creator has made a desire for knowledge a strong universal human instinct. To this He has superadded a special educational equipment to enable mankind to seek, find and utilize ascertained truths and facts, that is knowledge; the mental, moral, social, corporeal and spiritual training for the reception and utilization of which constitutes education. Jehovah has also supplied us with the knowledge, education and

Teachers best adapted to promote His Divine aim. And, furthermore, has promised to give true seekers after Wisdom His silent—unseen—but potent aid (Pc. xciv. 10) to find it.

Knowledge, notwithstanding its multiform modern divisions, may be primarily grouped under two great divisions; namely—that regarding God Himself, and that about the things that God has made or permitted. Knowledge is—general information. And, as the All-wise who designed and made all things, spirit—matter—forces and laws, clearly knows most about these; the knowledge which the Supreme and Mighty Councillor deigns to impart is necessarily by far the best, most trustworthy and infinitely superior to all that is purely man derived. The Maker of all things (1 Sam. ii. 3) is the Creator of knowledge also. It is well to note that what He supplies is ever more practical and utilitarian than ornamental. To mankind the Divine bequest of knowledge such as He supplies is both fortunate and opportune, inasmuch as we are one and all surrounded by and even interpenetrated during our earthly probation with countless deep mysteries and hard puzzles regarding not only the invisible Creator—His universe—and World, but even about ourselves; all of them matters of supreme import, regarding which the Deity has largely and beneficently lifted the veil materially by giving Earth and degenerate man certain disclosures having a practical educational aim.

The Human Educational Equipment

Educational information would have been practically wasted on man without proper organs and endowments to receive and develope it tuitionally. For this the Deity considerately provided in His complex design and biological Creation, Man. Next to God, man is the chief theme of the Bible Story. The tales of Earth, Man and the Creation are inseparable. The Book begins with the history of Creation; and condenses this into a pithy but pregnant half verse; to disclose its Author. The history of Earth is given at somewhat greater length, because of greater interest to man; and with a view to shew that it is part though only a figment of Creation, as is Man himself its chief occupant, whose story is still more detailed further on, and for a similar reason. The first few and especially the first chapter of Genesis thus embody facts of surpassing interest and educational import, especially regarding ourselves. The Godhead having honoured Man by making him in His "own image" (Gen. i. 27); giving him a not ignoble place in Creation "only a little lower than the Angels" (Ps. viii. 5); endowing him with an immortal and infinitely precious spiritual entity or "living soul" (Gen. ii. 7) which was the real human

Ego and then sin-free; making him the highest and most elaborate form of Earth-life—anatomically, morphologically, physiologically, mentally, socially, morally and spiritually; inducting him as Earth's chief occupant, lord and copestone over the lower animals (Gen. i. 28); giving him a special idyllic home in Eden and on an elaborately developed orb; making him and his Earth component parts of the myriad galaxies that form and circle round Him and His special abode, "Heaven" (Is. lxvi. 1); and, above all, fitting him to be appropriately taught and enabled to fill a lofty role, by supplying him with a special and elaborate equipment—organs and tuitional gifts by which knowledge might be received and education completed, consisting of:—

1st. An innate instinctive desire and thirst for information and knowledge.

2nd. Five highly developed, elaborate and acute senses or gateways for receiving and transmitting physical and other educational impressions.

3rd. To supplement these a central elaborate brain to record, weigh and utilize these impressions.

4th. An extremely sensitive moral sense and social instincts, by which moral and social information is received, weighed and applied.

5th. A well balanced intellect, conscience, and a soul for the reception, valuation, and application of spiritual knowledge.

At birth the brain, like the body generally, is immature and the mind a blank. Hence the human infant is the most helpless of all animals. These mature slowly; but when this is accomplished they far excel those of the entire brute creation in elaboration, receptive and intellectual capacity. Their activity and education begin at birth and progress as the brain developes.

The Divine Educators and Methods

The Divine object being to educate Man to love, serve and obey his beneficent Creator, and fulfil his special racial and individual mission; God had to develope Man's physical, moral, social, mental, and spiritual endowments by means of these organs. Their tuition was at first Divine; for God Himself walked and talked with Adam and Eve in Paradise; and doubtless instilled nothing but the most holy and elevating ideas; thereby to cultivate and render their spotless lives still holier, happier and God-approved. At their creation Adam and Eve had fully developed adult brains and intellects: and did not begin their tuition from the far lower plane and with the

immature organs of their offspring. They could think, speak, walk and act from the first. Although to them, as to the new-born infant, the world and life were new: they had everything to learn; and human education is a slow and complex process. But, like the babes, their schooling was at once begun; and as adults they would necessarily learn more rapidly. In its nature their education was physical (Gen. ii. 15); social (Gen. ii. 18); moral (Gen. ii. 17); spiritual (Gen. i. 2); and scientific (Gen. ii. 19-20); all of them departments meant to school them for God's purposes and train them to love, honour and serve Him who was so affable and Who so obviously controlled their happiness and highest interests, as He also did their health and very existence. Had Man, Earth's copestone and the most elaborate and highly endowed entity on our planet, been fashioned and gifted no better than the lower animals, how aimless would life have been, and how hopeless the future; and what need would there have been for education such as they had, or such as we now require. While as to what we are, where, whither bound, we should have been entirely ignorant, could never have discovered, and never even cared to find out. Man would have dwelt on Earth and lived his life in deep uncertainty, all unaware of the existence of God, the human soul and a future life. Fortunately for us, the Creator gave us individually the knowledge-craving, intellect and information of the kind He deems best and good for us at present to know, and talent to receive and utilize it. Human education, like Man himself, was thus initiated by the Supreme Author and Source of all that is wise and good. Earth may thus be regarded as mainly a primary school for human souls: in which the Deity condescends to be the chief instructor. We can never ascertain what the Deity taught the Primal Pair in Eden; but it seems both prudent and dutiful to study, as we shall do presently, the nature, source, aim, scope and value of the knowledge supplied by the same source, either by direct revelation, or left for us to find out: and, above all, to ascertain what varieties the Divine Preceptor chiefly desires Man to learn.

At the same time, the Holy Scriptures give no warrant for the belief that either Adam's or early Man's intellectual and educational development began and progressed from the plane of the Savage, and still less from the high-class Anthropoid: or that his anatomical and physiological construction and his rôle in Creation were not far above those of the lower animals, special and supernal, as affirmed by Holy Writ. For Man alone, of all that is earthly enshrines that mysterious spirit—the soul—that comes from and returns to God, thus making Man a part of Heaven. But, on the other hand, we may inferentially conclude from the Bible narrative:—

a That the Primitive Pair, though morally weak (Gen. iii. 6)

were not of a low but high intellectual type (Gen ii. 19-20); as were also their earlier descendants (Gen iv.).

b The position assigned them (Gen. i. 28, Gen. ii. 15), and the education supplied proved they were not inferior in intelligence.

c Their companionship and Educator (Gen. i. 28) was of the very highest rank; namely, their Divine Creator.

d This information is given positively; while no hint is found in the Holy Bible throughout of a previous ancestry; or of ascent from a lower type or types.

Does it appear probable that the Deity would permit the story of such a superlatively important event as that of our racial birth to be erroneously chronicled. On the contrary, the Mosaic account of Man's Creation and place in Nature is one of the parts of early history which the Creator seems to have taken pains to make exceptionally clear and unmistakeable.

But this perfect period of faultless living and docile instruction was vitally altered by Man's downfall. Another and an evil Educator had interfered to mar the Divine plan. For, like Satan and his fellow rebels of yore, Man kept not his first estate: and so, like them, was not spared, but punished and degraded (Jude vi.). Human obliquity, Satanic craft, and alluring sin materially altered the Divine plan for benefiting the new race. This vital change involved the Divine educational projects. The deep and important descent in the taught necessarily included alterations both in the teacher and the tuition. By his supreme folly, credulity, and faithlessness, Man, the pupil, had become degraded in the scale of Creation: and, from being semi-angelic was now sin-imbued, unholy and unfit for oral intercourse with the pure and peerless Godhead, as formerly in Eden. Jehovah no longer condescended to teach Man directly and personally but by proxy, including the agency of specially selected servants. Can we doubt that the result of the fall was to make both Adam and Eve "rise on stepping stones of their dead selves to higher things" and become teachers of righteousness to their offspring. Abel, Enoch, Abraham, Isaac, Jacob, all set Godly examples to the then scantily peopled Earth; beacon-lights in a sin-struck world. Then followed Moses, with his earlier Bible, the Pentateuch, and still later the Prophets and others. Sin begets ignorance; mental, moral, social and spiritual decline. The hereditarily and individually evil race that sprang from the now debased Adam and Eve required far more stringent correctional teaching and enlightenment to enable such as would accept aid from falling into deeper depths, and help them to recover from the pit of ignominy into which they had already fallen. Sin had truly opened their eyes, as they were told, and increased their knowledge, but in a wrong

direction, and to knowledge of a dangerous kind. Jehovah's new task was to counteract this by furnishing His free-will pupils with appropriate information of a very different nature. Although the first human sin had left man spiritually, morally, socially, mentally, and perhaps physically degenerate, he still remained Earth's sole or chief intellectual denizen. He had stained with sin his highest nature, and that part which God most delighted in, the Soul. His new position was so altered for the worse as to require a longer and higher educational evolution to enable him to properly fulfil the special rôle which every individual is sent here to perform. Man had now to be taught something else; and not only allured to love and seek after holiness as the supreme good in life; but also shewn how to avoid and hate its antithesis and opponent Sin, in order to rehabilitate those spiritual, moral, social and corporeal entities which together form the whole of Man. To accomplish this the knowledge supplied had to be materially altered and increased.

The Three Divine Educational Revelations

Jehovah, the beneficent, had already given Man certain talents or gifts to enable him to study his Creator, works, ways, aims and attributes. But as God had further withdrawn himself from the now rebel human race; and to meet the new educational conditions and requirements He superadded an auxiliary explanatory text-book, guide or manual to shew that the study of Divine were of far more import than the pursuit of earthly things; a vital lesson they needed much, as we, their offspring, still do. This important educational volume, revealed by degrees and given as a far more easily understood complement and copestone to the other two previously bequeathed, was the Holy Bible in its earlier stages. So that Man had now three great and most important educational revelations to help to dispel some at least of the mist which surrounded him then as ourselves now; and solve some of the mysteries of our being. The Revelations which Jehovah donates as an educational basis, and which He chiefly desires mankind to follow, are the following three:—

1st. The spiritual and sole universal revelation, and that which forms the basis of "natural" or innate religion, is that personal intuition common to all humanity; implying that our great Spirit, God Jehovah, thus manifests Himself and His existence to His offspring, the spirit men or human souls of Earth, and also points out our relationship to and dependence on Him. This is the instinct which impels every one, Monotheist and Polytheist, savage and civilized alike, to realize per-

force the existence of a far more powerful and majestic being or beings than himself, namely the Divinity, who made, sustains and governs Nature in general and Man in particular; and in whose keeping are our individual and racial interests and destinies. Although, alas, this intuition, so precious and noble, too often remains in abeyance till called into activity under the impulse of the stronger emotions such as fear or grief; when the puny mortal, feeling his impotence and need of help, instinctively turns toward and cries aloud to his omnipotent but neglected Maker for succour and sympathy. This is doubtless the most important of the three Divine revelations; because it is widespread; no human being is wholly without it: and is, moreover, a special gift; personal—direct—unconquerable—ineradicable. This primary revelation derived as Man's birthright, gives one of the strongest indirect proofs of the reality of the existence of God, the human soul, and a future life; short of a personal demonstration of them. Man's belief in a Creator; his craving for immortality and for a future life happier than that of Earth, are innate. Nature and its Creator make no idle promises; give no healthy physiological or psychical cravings in vain: implants no instinct that proves fallacious, only to cruelly withold their ultimate gratification. Nor is she likely to stultify herself by permitting Man to waste his homage on a purely imaginary Deity; or dream of and build on a merely visionary future.

2. Another, the physical revelation is God's works; that is the record of His vast and abstruse volume of Nature; of which we and our world form an atomic part. This, the most ancient and universal of the three revelations, investigated by human science and scientists, and which—aided by the Divine help of the third revelation, namely, the Holy Bible, explains God's glorious—stupendous—and beneficent handiwork, comprehensively termed Creation.

3. The third revelation is the Holy Bible or written Word; a volume giving evidence more tangible than the first; but meant to confirm and corroborate and correlate the other two; and tell in simple, unmistakeable language about the Author of all things; His nature—attributes—aims—works—and ways; Man's relation to God, and God's to us. One of the chief objects of the Biblical revelation is, to strengthen and endorse the intuitive faith, or first and elementary stage of human religious life by informing us definitely about the "unknown God," whose entity would otherwise be vague and unconfirmed; leading thereby to ignorant (Acts xvii. 23: Numbers xv. 28) or unacceptable worship (Gen. iv. 5): and also to assure him of the reality of the soul, and a future life. Without this revelation the Deity would be a mystery; and Man a puzzle to himself;

as would also be our origin—place in Nature—past history—and future destiny. To the Holy Scriptures we owe invaluable information that can be obtained through no other channel; truths which unaided science, philosophy and intellect may substantiate but can never discover, modify or cancel, because they can only be "spiritually discerned" (1 Corin. ii. 14): and also evidences without which how tame—worthless—and unsatisfactory and miserable would the present Earth-life be (1 Cor. xv. 10); and how utterly hopeless the future (Acts xxiii. 6). This inspired handbook or Holy Bible was given Man by Jehovah to meet the new and more complex conditions of life; for his earthly education in the way he should walk, especially for his guidance and return to a higher and holier plane of life and living such as God desired; one of full obedience to Heaven, and its inestimable temporal and eternal blessings and rewards. The decipherment of the wondrous, widespread and mighty field of Nature, Jehovah has left mainly to Man himself. But as a corrective balance and supplement, lest our ideas should go too far astray on vital points of faith; and also to inform us of certain obscure facts regarding both Himself and His works—including ourselves—impossible for Man to discover without supernal aid, He has superadded His "Word," a revelation in which He tells us all that He in His Wisdom and Love deems it wise and necessary for us to know now. As we might expect—these two Divine volumes, the written—and the physico-vital are therefore clearly corroborative, interpretive, and explanatory; but never antagonistic or contradictory, when read aright and correctly interpreted. So viewed, our sources of knowledge are thus mainly twofold; namely Divine and human, sacred and secular. Thus supplied, our knowledge of the Creator is mainly Divine and Biblical: while that of His works is both Biblical or Heaven-revealed; and Secular or Man-evolved. The former, God-given, is manifestly the best—truest—and most valuable, because it is infallible: and, therefore, it is mainly this that the present volume investigates.

By the first of these revelations God—the parent Spirit—manifests Himself to His offspring collectively; and to each human spirit or soul directly and individually; and hereby originating in each that universal feeling—the religious, common to all mankind, savage and civilized alike. By the second He appeals to the intellect mainly through the senses. By the third he does this indirectly, mainly through the human intellect and reason—heart—faith—and feelings. The limited bestowal of the latter makes it all the more precious to those nations and persons privileged to receive it: seeing that it so materially endorses and amplifies the evidence and convincing effect of the other two. Though distinct these three educational revela-

tions are mutually inter-dependent and corroborative: and conjointly form one grand and incontrovertible mass of evidence of God's real existence and power. And that form of religion is necessarily the most satisfactory and perfect, the tenets and investigations of which, like the Christian faith, embrace all three.

God's Holy Bible

Our chief interest therefore centres for the present in the third of these educational revelations, the Holy Scriptures; the great handbook which the Divinity meant and still means to be Humanity's chief instructor, though still despised or hated by many, but deemed by Christians to be unique—incomparable and priceless: thus—

1st. The Bible is *Divine* and the only Divine volume on Earth. Jehovah is practically its Author: for in it the Creator directly or indirectly instructs the created: the Supreme Father teaches His earthly children: Heaven speaks to Earth. No inconsiderable part of the Old Testament, especially the Pentateuch, including the entire Mosaic or Sinaitic Law and much more, is given in the very words of Jehovah, the First Person in the Trinity. The voice and words of Jehovah delivering the Decalogue or central gem of the Sinaitic Law were heard and the accompanying phenomena heard and witnessed by over two millions of awe-struck Hebrews. No small part of the New Testament, and its very best portion, contains the very words and wise sayings—fully verified—of the Saviour—the second person in the Trinity. The rest of the Holy Scriptures was written by men selected and inspired by the Holy Spirit, or third person in the Trinity, who led them to think and pen as He directed. The supernal origin of the Holy Scriptures alone makes it precious to Christians, for it comes from the Father—and their original and future home. The Holy Bible is Divine and Jehovistic; and, therefore, incontrovertibly true. It is an emanation not only from Heaven but from Heaven's Source—Centre—Pivot and Lord; the Eternal Godhead and Supreme Wisdom.

2nd. As forming part of the history of God's Creation, and as His story of the evolution of Earth and Man's sad tale; the Holy Scriptures become Celestial, an emanation from the Supreme Heavenly Intellect; and, as such, the world's sole immortal book. Human beings do not destroy their records. Is not the Allwise less likely than His weaker offspring to destroy His records of the Divine architecture? Will not the Holy Bible be found by the Redeemed among the Heavenly archives, side by side with the stories of the Earth's sister planets

and central parent Sun; side by side with the stories of the countless orbs—constellations—milky ways—star-groups and galaxies of Heaven? And found there because it is one of the volumes necessary to complete the wondrous and lengthy story of Creation, and that of the Eons of Eternity over which story extends; one item of the marvellous catalogue of a myriad entrancing volumes.

3rd. The comprehensive beneficence of the gift of the Holy Bible as an emanation from the All-love endears it still more to Christian minds: because its aid and instruction were and are not meant for the Jews alone, though given first to them, but for the Gentiles also, and the entire human race. Its tuition, knowledge and benefits are for every race—tongue—church—colour—clime—creed and period. Like the All-Heart Himself so His true disciples desire its universal spread (Mark xvi. 15); so that all mankind may have the opportunity to know, love, serve and worship Him, and the race to return to its original fealty.

4th. The personal value of the Holy Bible is immense; and there are certain most important individual reasons for the store which Christians set on the Holy Scriptures. It speaks authoritatively and tuitionally on every conceivable subject relating to Man and the human race; so that it would be difficult to epitomize the many important facts it relates about our past—present—future—and so on. The book appeals to every soul as a separate yet responsible person: and its Author desires its contents to form the most prominent part in the education of every human being, especially the young (Deut. xi. 19: Deut. xxxii. 46); the Deity Himself thus deigning to become Man's chief instructor regarding how to walk and live wisely, and use best those gifts and talents God has bestowed on all. This department of knowledge is one the Deity desires every soul to know, because it supplies information of the highest value, to be found nowhere else, and that no one could ever personally discover. Its educational information is not for our earthly entity only but for the whole Man—soul, body, mind, morals and social life; meant both for this and the next world's interests. It aims at making us holier, better, happier, trustier. There is no item of true and high educational interest or import, public—private—commercial or racial that is forgotten. The educational interest of the Holy Bible in the individual is especially pointed. With all mankind—Monotheists—Polytheists and Heathen alike, the Ego is the dominant factor; and our human educational methods have all along revolved largely round this human pivot, as have those of the Divinity. To wisely care for self is a Heaven implanted instinct; and therefore a duty. Hence it is the department of knowledge most

sought after. Self and happiness are the motive forces that lead all to desire and aim at success in life. But Christians differ from the mass of mankind in recognising Man's dual and composite nature; and in deeming the true, permanent or soul-ego of infinitely greater import than the temporary or body-ego. They estimate similarly the knowledge concerning these two temporarily and mysteriously blent entities. Christianity is the copestone of all earthly knowledge; as it also is of true Manhood and Womanhood. No species of learning is of such vital personal import to every soul as that with which it enlightens us direct from the best and indeed sole authoritative source, our Divine Designer—Evolver—and Sustainer Jehovah. For what more important branch of human education is there or can there exist than that which reveals facts about those deep abstruse and hidden matters that concern all mankind individually far more than anything else, namely ourselves? For example, what form of knowledge or species of education is more apposite, valuable or welcome to all than that which does not leave Man in complete darkness or doubt, but instructs him at first hand, and in the Deity's own select words, facts concerning one of the most obscure of subjects, Man's true place in Nature; his relation to Nature's God; why Humanity has been placed here; or tells that this ordeal entails that their future shall be one of weal or woe; also how we may attain the one and avoid the other; and, finally, that God enlightens and educates us thus minutely for our sole benefit, in order that we may turn to Him, love, reverence and serve Him and Him alone. How deeply indebted, therefore, should those be who enjoy the privilege of possession and perusal?

5th. Christians value the Holy Bible for still another important reason. It is a cyclopœdic informant on general knowledge, and thus the best of educators. It is well for mankind to have inherited such a bequest from such a Donor. For we are surrounded and even interpenetrated with innumerable and deep mysteries and puzzles from some of the more prominent of which the Deity has beneficiently lifted the veil in this mode; and thereby constituted Himself Man's chief instructor in some of the most important and abstruse subjects humanity has to study. It is impossible to give here more than a mere outline of a few of the many topics on which our Gracious Teacher, who knows what Man is and his capabilities (Job xi. 11; John ii. 25), enlightens us in His Holy Book; either pointedly and fully or cursorily and incidentally, though not unfrequently anticipatively: thus in all cases making its study deeply remunerative, and the Holy Scriptures supreme among books, and an unequalled model volume for its towering wisdom, as well as for its many other excellencies; a book in

which even modern scholars and scientists may find valuable suggestive tuitional and often pioneer hints; that should have proved of priceless value in earlier and far more ignorant Bible days; and ought to do so even now.

For these reasons, therefore, in Christian eyes the Holy Bible is of priceless value to every human soul; and it is the only book which tells one of the most interesting, thrilling and saddest of all stories, that of our early ancestors and our Earth: shewing how sinful—wilful—unwise and ignorant we have made ourselves; how great is the human need for reliable knowledge and tuition in this the first or Earth-stage of our unending existence; and the vast importance of the higher education in the estimation of the best of all Judges, our Divine Architect. For all the information that concerns early Man; his intellectual capabilities, education and educators we can turn alone to God's volume, the Holy Scriptures. No other book or credible authority supplies the information. No earthly volume tells us, and often anticipatively, information that can be found nowhere else. No other gives the authoritative early history of education itself; or is in itself and throughout so entirely and eminently educational. No other book contains so composite and lengthy, yet condensed, a history as that which Jehovah has seen fit to write and edit by proxy in the volume so aptly named "the Book," because it is so unique and instructive, especially in educational matters, which run like a thread all through the book; the narrative of which stretches from the humanly immeasurable eternity of the past on to the equally incomputable eternity of the future; and speaks on subjects of the deepest educational interest and importance to the entire human family, individually and collectively. No other book is so many themed and instructive; or supplies subject matter for one and all to select from. For of the countless things, laws, and forces that God has made there is scarcely a department, whether of philosophy, science, art, literature, that is not either illustrated or alluded to. And no other book contains information of such wide import, or speaks so fully, simply and correctly of those things on which our human faith—hope—peace—happiness—life—health, and all we hold most dear for time and for Eternity are based: because it is told indirectly by the highest, best, and, indeed, sole Authority, the infallible Supreme, who is the Author and Owner of all things, including ourselves.

The opening chapters of the Divine Volume are of especial and absorbing interest and import, both racial and personal, as supplying facts which form the basis of our faith in the present and hope for the future. For of its innumerable topics those which concern Man himself naturally rank first. Next to Jehovah, Man is the chief theme of the Holy Bible. And into

this engrossing subject it enters almost at once by describing Man's relation to the wide universe, and assigning him his place in Nature. For the God who manipulates mighty and countless stars and constellations as we do sand grains, prompted and instructed His chosen amanuensis and historian, Moses, to begin this volume by telling us of the birth of Nature, that vast entity of which Man and his Earth form only a very infinitesimal and subordinate part. And He does this tuitionally that we may not remain in complete ignorance of what we are, where we are, and why. The knowledge He imparts in His Holy Bible He deemed it necessary we should know. It is, therefore, well that into the nature, quality and reliability of this we should briefly enquire, as a prelude to the study of the Divine Hygiene; our chief subject.

Of the many different branches of knowledge on which the Deity deigns to enlighten and educate humankind by means of His Holy Book, the Bible, we can here only give an epitome of the following more important ones, as illustrative of the whole.

The Literature of the Bible

Of what nature is the Diction of the Holy Book, superior—inferior—or mediocre? As all that exists is Divine, therefore incomparable and infallible, it is not surprising that all experts find the literature, subject matter and literary style of the Holy Scriptures are all matchless and super-excellent and unsurpassed. In all of these respects the volume is acknowledged by the ablest literary men to be the peer of books. God's Holy Bible is a great literature in epitome; a wonderful educational compendium of thought; a magnificent record and magazine of facts replete with the most valuable information on innumerable subjects of the very highest human interest and weightiest import: sometimes directly imparted, but often incidentally and inferentially: much of it being unique and obtainable nowhere else: often found there first: and in which priceless facts, new beauties and excellencies both regarding sacred and secular matters are being constantly discovered by earnest Bible students. Hence it is why God's great and unique educational handbook has been compared to an encyclopœdia, nay, a library, in which for depth, versatility, comprehensiveness, sublimity and beauty of diction, it not only reigns supreme but far surpasses the very highest of human efforts as to stamp it the best of all books, altogether apart from its Divinity. Even Earth's deepest thinkers and greatest geniuses, such as Sir Isaac Newton, Sir David Brewster and the most eminent Divines, have never fully compassed more than one of its books or only a few of some of its most abstruse pages.

The Holy Bible does not deal with fiction, but select fact: and its literature is mainly humanly educational. Science and Philosophy of the deepest kind is largely dealt with. But in Christian eyes the chief worth of the Holy Bible is that its instruction appeals to and teaches—not so much the worldly senses as our higher nature. In this respect God's Holy Bible may be regarded as a book which is growing fast in importance and value as the world becomes enlightened; a volume of which the influence and authority will increase with the growth of knowledge and the desire for information.

As regards its subject matter; revealed—promoted—practically edited—and protected through the ages by the Deity Himself; the chief theme of every one of its books and of the entire volume is tuitional, religious and meant to educate our rebellious and sin-smitten race upwards, and bring us back to our pristine fealty, purity and faith in our merciful, forgiving, and loving Maker: to lead us to strive to regain our lost position in Nature and in God's sight. Nor does it surprise Christians to find its prose and its poetry both replete with the deepest truths and highest wisdom: much of this, and all the best in the very language of the language-maker, and mighty Councillor, the Trinity. For example, the Decalogue by Jehovah (Exod. xx.), of which it may be averred that no human being or law-maker could with any three hundred words, judiciously selected and wisely arranged, compose a code so superb, comprehensive, complete, so adapted for the whole Man and entire race, for all creeds—ages—epochs—and degrees of culture and civilization. Of the Christ-Lord's Prayer (Mat. xx. 3) may it not be asked, what human mind could select and put fifty-five words together to form so apposite and comprehensive and perennial a petition? Christ's Sermon on the Mount (Mat. v.; vi.; vii.) is, and will ever remain, an unsurpassed code of the highest spirituality, purest morality, and best social conduct in the world. So, too, of Christ's other utterances, illustrated and enforced by parable and miracle; all are sparks of Divine Wisdom unsurpassed for lofty condensed thought and wise guidance for Man both in temporal and eternal things, such as no uninspired, sinful mortal could conceive or pen. Add to these specimens of strictly Divine precept the indirectly supernal utterances of the inspired penman of the Holy Bible, such as the Psalms; where could Christians of every age and condition meet with such hints and helps for their soul's welfare, or find a better directory for soul-elevating, heart-gladdening and inspiriting communion with God: beautiful truths far above this world's wisdom; and such a wonderfully accurate and veracious analysis of the workings—joys—and sorrows of the human heart: or a truer synopsis of religious experience.

Again, it would be impossible to give a more perfect code of rules than those plain and simple maxims scattered through the Book to tell us how we may individually and collectively attain the highest happiness and God's approval in this probationary existence, and the unalloyed bliss of the future life. The complete Biblical production furnishes the basework of the noblest personal, social, political, moral and spiritual educational fabric in the world.

While the best human prose is far surpassed by that of the Divine Book, so the Bible poetry far transcends all uninspired secular efforts, by giving us priceless gems of thought framed in the most beautiful of word settings. The Hebrew poetical effusions found scattered over the Holy Bible infinitely surpass in grandeur—sublimity—beauty and pathos all the most celebrated productions, not only of Greece and Rome, but of modern times. From the 90th Psalm, which might have been, and probably was, inspired by Jehovah Himself, downwards, no poetry can ever equal that of the Psalms—Ecclesiastes—Song of Solomon—Isaiah—and most of the Prophets, for pathos—sublimity—beauty—animation—force—and expressiveness; as well as for comforting and sustaining the human heart. Where can humanity find wiser maxims and advice or a better guide for their private, social and communal conduct on Earth and their worldly protection; or a more complete code of sagacious practical sayings—moral precepts and religious teaching—poetic wisdom and philosophy, than in Job, Lamentations, Proverbs and Ecclesiastes; to equal or rival which no human learning can ever attempt. These are books for all mankind and all time. Each verse—precept—fact—and promise is a gem framed in select words; and the whole a mine of wisdom and love, regarding which it has been remarked—that had it come from Greece instead of Judea, no mention being made of their Authorship, the wisest men of this world would never have ceased to extol and glorify them and laud their Author. Job is another of the Bible-books for all mankind; the simplest—sweetest—grandest poem ever penned by Man, openly or anonymously, and of surpassing literary merit; to say nothing of its profound wisdom. What secular songs are for a moment to be compared with the Eucharistic Song of Moses by the Red Sea (Ex. xv. 1-18); than which no more admirable hymn exists; or one fuller of strong and lively imagery. And then that of Deut. xxxii. 3; how excellent its flights, noble and sublime its raptures. Deborah's song (Judg. v.) and Barak's (Judg. viii. 5); and that of Hannah (1 Sam. ii. 1-10), are all full of sublimity. How incomparable the elegy of David on the Death of Saul and Jonathan (2 Sam. i. 19-27). How beautiful the gratulatory hymn of Is. xii., and Hezekiah's song of praise

(Is. 38). How sublime the description of the Divine Majesty in Habakkuk viii.; Mary's song (Luke i. 46-55); Zacharia's prophecy in Luke i. 68-79; Simeon's (Luke ii. 29-32). These are all lofty—religious—and educationally of the utmost value. The whole of the Biblical poetry consists of "pure words" (Ps. 12. 7); not one of its least attractive features. It is full of valuable, spiritual, moral, social and general intellectual instruction, admirably chosen in thought and word by the Deity for His human children's enlightenment. Altogether in no respect can any human literary production ever be expected to equal the Divine or Divinely-inspired emanations. The best of human intellectual achievements, prose or poetry; and the deepest knowledge all pale before those of Jehovah and His specially selected servants. The creator of the human frame—intellect—and organs of speech; and His special handbook for Man's enlightenment, are obviously the best instructors and educators of humankind in literary matters; in the evolution of ideas and the investment of these in judicious language. For the Christian life, so beset with crosses; and for the Christian mind, so supersensitive and conscientious, what a treasury the entire Holy Volume is, so admirably adapted by the All-wise for the guidance and education of Man. What a storehouse of heavenly devotion, full of affecting and sublime thoughts, pious and affectionate prayers, holy meditations and exalted strains of praise; combined with the sublimest descriptions and most beautiful allusions; are found in those parts we most peruse, and read most, because they most meet our mental, moral, social and spiritual requirements.

Biblical Science

Science of many kinds is frequently alluded to, illustrated, and sometimes, as with Hygiene, spoken of at considerable length, and its laws practically defined in God's Holy Scriptures. So frequent is this that the unbiassed, reverent and receptive mind will be astonished at the amount of reliable scientific information which the Holy Scriptures impart to the devout investigator. Science is not unfrequently, but yet erroneously, spoken of by the multitude as something altogether apart and distinct from God, if not antagonistic to Him. But, although the Holy Bible has been voicing many sciences for centuries, most of these have not been deeply investigated till comparatively recent times, either secularly or Biblically. And yet science is altogether Divine: seeing that it is merely the study of Nature or Creation: that is the matter—works—forces and laws of God; all of which date their existence back to the "beginning" when, like all else, they were made—formulated

—evolved—and brought into being as an outcome of Almighty power and versatility. As a study, the many different branches of science embrace the whole of Nature. On the other hand, the Holy Bible, or God's Word, is a literary production and gift from the same comprehensive and Divine mind; of infinitely later date, even in historic times: and is a revelation meant to supplement other revelations and explain both God Himself and His works: so that Man may not make certain grievous mistakes, such as many have done and still do who have not or refuse this guide, especially on certain vital points regarding God Himself, Man, and their mutual relation. Both science and the Holy Bible being the work of the same Divine Author, or His selected servants, it is unlikely, and, indeed, impossible, that He would have permitted the two to disagree. The Biblical scientific allusions are merely the Creative power revealing Himself in order to teach benighted and ignorant mankind. His utterances are educational. Science, that is the investigation of God's works, is the evolution of the Will and Intellect of the Deity, and that alone. Jehovah is the Supreme Scientist; the Author of Science; and its Teacher; Man being His scholar. Scientists are students under and pupils of the Divinity. Like much else that is Biblical, the science of Holy Writ is apt to be decried and discredited, because it is Scriptural, and the Holy Scriptures not generally, though erroneously, considered a scientific authority. Christians, however, believe in its scientific truth and infallibility, because it is Divine, and the clearly-written record of God's works by inspired men of His own choosing: and aver that no humanly evolved scientific finding that disagrees with Holy Scripture can be correct. It seems impossible for God's Word and His works, accurately read, to disagree. Christians would be surprised if they did. God's Book is the earliest exponent, and Jehovah Himself the real "Father" of all the Sciences and Philosophies; not only because He is their earliest exponent, but by the truer paternity of Authorship. Modern and ancient Biblical sciences are both studies of the works of God. Modern science is only a study and recrudescence of knowledge initiated centuries ago by the Holy Scriptures; knowledge which was overshadowed and well nigh obliterated during the post-Edenic descent of Man.

Though individually distinct, these two Divine records, God's Word and His Works, conjointly form one great whole; each being the complement and exponent of the other: the one being intellectually inspired and the other physically evolved by Jehovah. Hence veritable religious belief and true science, which alike spring from the same Divine source, can never conflict. And, though few of the Biblical sciences, except perhaps Hygiene, have escaped discredit and even contumely; it will

doubtless be ultimately found that those philosophic and scientific facts alone are genuine and reliable that agree with Holy Writ. Doubtless time, bringing with it improved translations of the one and truer investigations of the other, will yet shew that they are not antagonistic and contradictory, but mutually dependent and corroborative; both being necessary to make the invaluable inheritance perfect and complete.

Many, if not most, of the deductions of modern science have been amply confirmed and endorsed by Holy Scripture. Others, and notably Ethnology and Geology, or the story of Man and his Earth-home, still seem to differ. On the other hand, one science, namely Physical Archæology, is fully endorsing Holy Writ. But other recent humanly interpreted sciences have done much to correct our narrow human views of God, of his Creation, and its Biblical record; the faulty interpretations and false conclusions of Scripture, and to explain and emphasize many of the abstruse allusions and facts of Holy Writ. Thus—

a By shewing that the "days" of Earth Creation (Gen. i. 5-8-13) were not brief ones like ours but lengthy periods of time and geological epochs (Ps. xc. 4).

b That the Biblical "beginning" reaches back for a humanly incalculable and inconceivable period: and is different from the "beginning" of Earth formation.

c That the Hebrew and other ancient cosmogonies were wrong in asserting that the Earth's body was an immense disc supported, like the roof of an Eastern house, by pillars (Job ix. 6; Ps. lxxv. 3, civ. 5; Ps. xxxviii. 4-6; Prov. viii. 29), which rested on solid foundations. The more philosophical view is that the Earth is suspended in free space, as implied in Job xxvi. 7, and round (Ps. xviii. 15; lxxxix. 12; xciii. 2; xcvi. 10).

d That the reading "water under the Earth" (Ex. xx. 4) does not mean a vast subterranean ocean as one supposed, but should be read in contrast with the "heaven above" (Gen. i. 6-9), and "Earth beneath," as implying the comparative elevation of the three.

e That the World is not a disc (Is. 40-22) bordered by the Ocean (Deut. xxx. 13); and possessing "four corners" or extreme ends (Job xxxvii. 3; xxxviii. 13).

But while modern science has often proved that Bible science is strictly correct, as it has notably with Hygiene, it has never yet proved that Bible Science is erroneous or antiquated; and never can. And, doubtless, every other science will ultimately fall into line with the Divine Scriptural record; as both of these become read with greater accuracy. Science is one of the main weapons employed by unbelievers to prove the fallacy

of the Christian faith, by attempting to shew that the science of Scripture is erroneous and antiquated. But,—

1st. Is the Author of the matter—forces—and laws of Nature, and of the volume which explains it, likely to have made the two contradictory, and thereby undermine the reliability of both, and thus destroy the faith of His followers. The greatest of all inventors of new things, forces and laws, the Creator, is no more likely to give us an erroneous description of His work in His Holy Bible, than is any human manipulator in a scientific record: for at best the latter are but fallible creatures possessing donated, limited and finite intellects.

2nd. The all-wise and infallible Creator is surely a better judge and authority regarding scientific truths than these.

3rd. Modern science shews that Bible scientific revelation instead of being antiquated, is correct—perennial—and often anticipative of that which is human.

4th. The best and safest critic of the science of the Holy Scriptures is—not a sceptic, or an indifferently religious, but a God-fearing, Bible-believing scientific mind.

No Scientific Divine or Godly Scientist can engage in a more Divinely approved humanly appreciated, or nobler study than the correlation of God's Word and His Works; and the proof that these cannot possibly differ. Is not this a matter not for controversy but for the mutual Christian co-operation of Divines and Scientists. Biblical and scientific investigations are alike sacred. While God and His two records are true; God Himself is truth; scientists and Divines truth seekers, nor should the noteworthy fact be forgotten that not a few of the acknowledged leaders of science have been devout men, humble Christians and earnest Bible students, who found no real difficulty in seeing how Scripture and Science might be reconciled when our knowledge of both is more precise; and tried, each in his own sphere to promote this corroboration and help to prove that the Bible is the World's most precious treasure, because it bears the highest and holiest mission of any volume, since by its influence it is that the knowledge of the Lord shall cover the whole Earth as the waters the channels of the deep.

The investigations of Divines like Chalmers and Buckland, and of Scientists, like Newton and Brewster, prove that the scientific illustrations of Holy Writ, made and bequeathed by the Divinity, and given to incite humankind to further study on similar lines are fully reliable and not cancelled by modern findings. Is not the testimony of believers like these to be preferred to those of doubters like Huxley and Hæckel.

Doubtless, therefore, God's Holy Bible will stand this last daring assault, the "higher criticism," as it has withstood so many others. Nor will any such detractors or detraction lessen its value or credibility one jot in Christian minds. When the Holy Word is everywhere correctly translated, and science made perfectly accurate, it will doubtless be found by correlators that those scientific "facts" alone are genuine; and that secular science alone true, which agree with Scripture: and, on the other hand, that those Scripture versions, translations and readings alone are correct which endorse true science.. Fancied discrepancies will then disappear; apparent enigmas will be solved; and the close correspondence between the written text of the Holy Bible and the unpenned physical record of Nature fully recognized. In other words, it will be found that Science and Revelation are not antagonistic and contradictory, but mutually dependent and corroborative: that while science teaches religionists, religion reciprocates to scientists: that both science and religion mutually confirm dubious views while correcting erroneous ones: that both contribute to sweep away ignorance, and are calculated to advance the best interests of mankind: and, therefore, that, since both are necessary to make the invaluable inheritance of revelation a complete and perfect gift, neither need be afraid of the other's progress, but, on the contrary, ought to be anxious to aid it.

Like the Saviour Himself, so the Holy Book has been despised and rejected of men. For ages doubters have questioned and unbelievers denied the inspiration and credibility of Scripture; dupes to their own scepticism or hatred to religion and its restrictions. These have attacked the Bible from every imaginable side; either on the score of its prophecies, history, biography, ethnology, chronology, archæology, morality, literature, authenticity, and so forth. In every case the ultimate victory has been on the side of the Bible. More recent attempts have been made against Scripture science, from the side of its anthropology, ethnology, zoology, biology, and especially its geology. But doubtless, as in other cases, these attempts to invalidate or lessen the accuracy, credibility and inspiration of Scripture will prove equally futile.

The close agreement so apparent between Biblical and modern Sanitary Science, to be pointed out in the following pages, is therefore both very interesting and highly important. The correctness of this one of the many Biblical sciences thus assailed has hitherto been left unmolested and unimpugned: and that not altogether perhaps because it has been overlooked or considered antiquated and archælogical and unworthy of notice, but mainly because it is incontrovertible and unassailable; therefore a poor weapon for a doubter to wield. That

science is medicine; doubtless the oldest of all the sciences. Styled "Divine" by the ancients; and of which it has been said "that in nothing do men approach more to the gods than in giving health to mankind," this science and art has a far better claim than ever they supposed to that title, and to be deemed of sacred and Divine origin, since none of all the arts and sciences spoken of or alluded to in the Holy Bible are oftener mentioned, or have no many of their tenets, main facts and even minutiæ so often or so deeply laid down, fully spoken of and curtly, yet comprehensively and carefully, and even codified as medicine. This is especially true of its most important and philosophical department, hygiene, the preservation of those twin boons of heavenly beneficence, life and health, two of Man's most important earthly possessions. And thus also that polyglot science, medicine, which, a science in itself, special and abstruse, and both the most profound and most complex of all, yet draws into its vortex, calls to its aid, either directly or indirectly incorporates and makes use of as part of itself every other actual or conceivable art and science under the sun; a claim which no other art or science can make. It thus appears that this, the earliest and most exacting of all the sciences joins the many fellow-sciences which it enfolds in shewing:—

1st. That correlated portions of Scripture and science, which from time to time have appeared at first to be irreconcilable have been shewn to be confirmatory, when further light has cleared up the difficulty. As for example, when the Bible days of Creation (Gen. i. 5) were shewn by human science to mean not mundane but creative days, or long periods of time (Ps. xc. 4; 2 Pet. iii. 8).

2nd. That present apparent discrepancies will ultimately and in like manner be cleared up as Biblical and human knowledge advances. So that in the end no real disagreements will ever be established, apparent discrepancies will merge into harmonies, and objections will be turned into proofs.

3rd. That apparent disagreements between the Biblical and scientific sources of knowledge arise either from hasty or erroneous interpretations of Scripture or of the facts of Nature, one or both.

4th. That no new discoveries, however wonderful at first, or apparently diverse from Scripture teaching will long remain even seemingly antagonistic: but will ultimately be made clear; apparent discrepancies being turned into harmonies; objections being converted into proofs of Scripture inspiration, though they may perhaps for a time apparently disturb the harmony which does and that ought truly to subsist between Scripture and science.

5th. That none of the discoveries of science, however

startling at first sight, ought to disturb our belief in the truth and inspiration of Scripture, or lessen our interest in the beneficent advancement of science.

6th. That wherever apparent discrepancies have existed, they arose on the part of Man, the fallible interpreter both of Biblical and secular lore; and not on the part of the infallible Author of all things, or His equally trustworthy revelations—His Word and His Works: and are due either to ignorant or hasty conclusions of fallible men.

7th. That neither correctly interpreted and understood Scripture nor correctly deciphered science can err. Nor can the mutual harmony between these be ever really broken.

8th. That the Holy Scriptures, our universal heritage, that have withstood so many and so varied attacks of sceptical minds, will ever continue to do so. Christians always have and still do stand firm: and no existing Christian community has yet abandoned one single portion of the Canonical Scriptures.

9th. The discussion of the relations of the Bible and science are still going on unceasingly but are changing in character, being now less loud and angry: and it will continue to be carried on, but more and more amicably, if we could ever remember that all Truth and all things Biblical and otherwise are of, or only permitted by God.

The science of the Holy Bible, about which there have been so many disputes, is as noteworthy and scholarly as its literature. The Scriptures are not devoted solely either to general or physical science. And, as a rule, and with two notable exceptions, namely Theology and Medicine, their scientific findings are merely allusions, and incidental to the text. Still, not only are the elementary or base facts of most of the great sciences given, including some of comparatively recent modern development; but important modern theories and discoveries are not unfrequently foreshadowed in a manner that stamps the book as of no less profound than ancient scientific authority: and shews that the philosophy of the Holy Bible only required modern enlightenment and research to decipher and illustrate it. The Biblical educational illustrations of science, let it be remembered, date back many centuries and even some thousands of years to the era of Moses: and are taken both from animate and inanimate nature. Some of the Biblical scientific facts may appear frivolous and elementary to modern minds, especially scientific ones. But they were adapted to the educational plane of the earlier ages and for the laity, not for the learned: for beginners in scientific study; for simple rather than for the erudite of those and modern days. The given facts are true; yet mental milk for intellectual babes. Even at the present day many, even Bible readers, are ignorant

of such knowledge of science as the book they study imparts, because they fail to examine and receive those instances in which the elementary educational aim is clearly evident. Though sometimes accommodations of truth for unlettered minds the scientific allusions of the Holy Bible are usually no mere conjectures, but definite anticipations of facts which science has either already or will yet unfold and register, or which philosophy may decipher and illustrate. Many important facts and puzzling questions are also given; so that philosophers may yet find some abstruse problems in its pages: and notably those asked by Jehovah (Job xxxviii., xxxix., xl., xli.). As in the Holy Bible, we find the sublimest of thoughts in religion and philosophy crystallized and gemmed; the most marvellous facts in Sociology, Astronomy, Geology, etc., taught; so in it we not unfrequently find the grandest problems in science solved, and that not in deep and abstruse but in simple and popular language which all can understand. Not only are the higher sciences, but also art manufactures, commerce, writing, engraving on stone, mining metallurgy, building, shipping, &c., &c.,are alluded to, especially in Job, in terms which betoken familiarity. In many departments of general science the Holy Bible antedates many beneficent discoveries, innovations, inventions and improvements. It contains allusions and hints, which, if accepted, would have advanced and anticipated modern observation and progress by centuries. These in almost every department of human knowledge give proof of the profundity of its observation; fresh instances of its inestimable value to the human race; and of the kindness of its All-wise Divine Instigator and Author. The Holy Bible initiates some of the sciences; for example, Geology, Ethnology, Genealogy, and notably Hygiene. Those which it does not strictly initiate it puts on a solid and systematic basis, *e.g.*, Astronomy, Philology. Sometimes the genesis of scientific discovery is intuitive. Far oftener it is the offspring of previous thought, discovery, or both, perhaps a series of these, one leading on to the other; either by the same, or oftener by other minds. Who can estimate how many of the germ seed thoughts and how much of the leaven that has led to not a few of the so-called brilliant conceptions and discoveries of the eminent scientists and philosophers of all ages, and even those of sceptical minds, who —for literary or controversial purposes have perused the Sacred Book, may have been all unwittingly sown, directly or indirectly by Bible reading? On the whole, perusal, and especially study of Bible science by God-enlightened minds, begets the devout idea that Man ought not, as he too often does, judge the Creator and His capabilities by his own puny powers, spiritual —moral—social—or physical. Or estimate the wonders and

extent of God's mighty and wonderful creation by our own small globe. Bible science, above all things, teaches Man his littleness and insignificance, both racial and personal, in the Cosmos and the monarchy of the Mastermind.

Biblical Theology

The human race is much indebted in various other ways to the most prominent of the Divine revelations, the inspired and sacred Word of God. Above all, for evidence of the truth of the great and interdependent fundamental facts, which form the basis of almost every religion, especially the Christian faith: namely the existence of God—the Soul—and a future State.

The Biblical education of Man in Theology, and its allied subjects, though subordinate, namely, Morality and Sociology, which have a large and important bearing on Hygiene, and, indeed, form its highest branches, need not be entered into here, beyond pointing out that these sciences are, far and away, the chief theme of the Holy Scriptures; and by far the most important branch of human knowledge, the exposition of which is the special province and work of Divines. In this preparatory school for human souls God has not left his pupils in complete ignorance regarding the unseen and only God; but has given us, in addition to the instinctive knowledge that such a being really exists; two great and invaluable schoolbooks, viz., His Word and His Works; the Holy Bible and Nature or Creation, for us to decipher; therein to find and see Him, as witnessed by His power—majesty—might—love and all of His other God-like attributes. No other book gives such clear and definite views of God and His attributes as this Divinely authorized volume; or teaches loftier Theology, to form and be the chief basis of our faith. But, besides this, it has an additional interest when the Divinity explains Physical matters, *e.g.*, Astronomy—Geology—Meteorology, &c., He does not discourse about something beyond Himself, or His personal knowledge, or that He has to study *de novo*. For are not these and all else His own special sciences, expositions of His own made and manipulated and familiar matter forces—laws and creations? When the Supreme illustrates Theology in His educational handbook, is He not the Author of the beings, forces and laws that form His spiritual and physical worlds; creations to which Man and his soul belong: and is not He better informed regarding the information He imparts than any other being; for is this not frequently exceedingly difficult, if not impossible, for mere unaided and dim-visioned humanity to fathom? The whole of the theological, moral and social teaching of the Holy Scriptures is meant to promote the health

and welfare of Man's higher nature, and of his spiritual, moral and social life. Need it be asked who was and is the greatest spiritual, moral and social philosopher the world has ever seen; and where the purest philosophic teaching yet offered to humankind: this higher hygiene, thus combining with the Hygiene of the Body to make the Holy Bible a veritable epitome of Hygiene adapted for the whole Man, soul—morals—social life and body; and a summary of sanitation which no other volume than the Divine can shew: theology being intimately interwoven with Hygiene and hygienic matter, a knowledge of God, with instruction how best to please Him and thus fulfil our mundane rôle as He desires. Theology, therefore, from a human standpoint, is largely hygienic. And the theology of the sacred Scriptures infinitely more important and valuable than all the other sciences together. Because the educational information it imparts and advice it gives are not only superlatively practical, but of eternal as well as temporal value to every human being, as interpenetrating our present life at every turn and at every moment. What book but God's Holy Bible, and what authority except its Author, could inform mankind on the following vital subjects:

a Of God's relation to Man, as his Creator, Preserver, Saviour, Comforter, Educator and Guide: that He loves Man with everlasting affection: and that we are completely in His hands, soul and body.

b Of Man's relation to God; his offspring, even though evil and rebellious; and that we ought to love, obey and serve Him because redeemed by Him, with His own life.

c Of our true relation to one another and the Universe: that as fellow sinners and Christ-redeemed we should help one another in Godly living.

d Of our relation to Satan and Sin: that we should abhor and avoid both.

What better educator or teacher than the Holy Bible to reveal what Man is, where we are, why here, our possible future, and what our earthly conduct should be? Where could we find another instructor regarding these? Of what priceless value to every human being and the entire race is the positive and assured knowledge of the existence of God; the human soul; salvation; and a future State? And how materially the instruction influences or should affect our life and our conduct on Earth, God's school for fallen "living souls"; and the hygienic care we take of our spiritual, moral, social and even our corporeal health, one and all so intimately intertwined. Without this knowledge how tame, aimless, and hopeless, sad and uninteresting would seem our earthly lives, bounded alone by the

grave. Without it Man would be a puzzle to himself; and the existence of the Deity a still greater mystery. While of our origin, place in nature, history, destiny, and those of the world created and fashioned for us, we should know but little. For these reasons, doubtless, God has made the theology the most voluminous and important of all the sciences of the Holy Scriptures. The theological knowledge and education which the Holy Bible imparts to every human soul is infinitely more important than all the rest of its abundant information put together, valuable as that unquestionably is. Although too often, alas, this, which ought to be Man's first, chief, and life-long study, is the last to which he applies himself.

Biblical Astronomy

This, the most sublime, is doubtless one of the most ancient of the humanly studied sciences. The contemplation of the unutterably splendid star-sprinkled heavens would early impel Man to study it and its manifold mysteries. Few can gaze on the midnight sky, with its fifty millions of stars, its five thousand nebulæ, each possibly as star-strewn as our own, the milky-way, without a feeling of inexpressible awe and wonder at its beauty—immensity—glory—and its countless marvels. The magnificence of the nightly moon and starlit panorama must have deeply impressed the free and pure minds of Adam and Eve; familiarized with the comprehensive thoughts of the Divine Creator by personal intercourse and tuition. Nor, after Eden, can we wonder at this being one of the earliest of human attractions; and the very first regarding which the Deity enlightens us regarding its most vital points.

Early Egypt and its Astronomers have left us an inheritance of Astro-historic value in the great Pyramid. The ancient Chaldœans also studied astronomy. But in this science likewise, as in so many others, Biblical not only antedates but far surpasses ancient secular astronomy, and supplies us with what not even unaided modern ideas could furnish, even inferentially. Nor can we doubt that this advanced revelation, free to all mankind for centuries, was given as a most important portion of our general human tuition; and mainly meant to dispel ignorance on a subject especially apt to beget misleading superstitions and even idolatry, namely as to the origin and Author of Creation. For the ancients failed to completely fathom this, the greatest of all the astronomical mysteries, and, but for Divine revelation, the Holy Bible, philosophic and scientific humanity could never have discovered or even conceived it. Students of old searched philosophy in vain as to the origin of Creation's myriad marvels; nor could they anywhere find them

explained, until they turned to one volume, first the earlier or Mosaic Bible, the Pentateuch, and, later on, the Holy Scriptures. No other Author or Book helped them, or can aid us in this enquiry. But there, and there alone, we find confirmed what is a universal and intuitive belief, namely, that not only this but all other worlds and material things were and are the handiwork of a Superior Being: and the still more important fact that that being is Jehovah, the "one" God, whom we love, serve and worship. "By the Word of the Lord were the Heavens made, and all the host of them by the Word of His mouth" (Ps. xxxiii. 6; Job ix. 9). Moreover, Jehovah is the Creator not only of the matter which formed the Heavens and Creation, but also of the forces and laws that govern these; for He "formed all things" (Prov. xii. 6; Colos. i. 16). No chapter in the entire Book contains the condensed story of such a lengthy period; chronicles such momentous events; or records facts so important—pregnant—and far-reaching, as the opening chapter of God's Holy Bible. Man's Biblico-astronomical education begins very early in the Book, namely with the first verse, scientifically one of the most pregnant—comprehensive—and important in the entire volume. This curtails a great fact into half a sentence of seven words, that "In the beginning God created the Heavens (Gen. i. 1); a most comprehensive and vital astronomical record: stating elsewhere that He "made them" (Ps. xci. 5); "prepared them" (Prov. viii. 2). The Holy Bible thus correlated the different parts of Creation; with the Solar system and its Satellite Earth, and shewed that the two latter were but a part of the former, and also who created them all.

The stupendous manifestation of creative power is elsewhere spoken of in terms which are eminently suggestive and comprehensive, and indicative of Divine forethought. Thus "his right hand *spanned* the Heavens" (Is. xlviii. 13); "garnished" them (Job xxvi. 13); "stretched them out" (Ps. civ. 2; Job xxxi. 11; Job viii. 9); and "forth" (Is. xliv. 24); "established them" (Prov. iii. 19); "named them" (Gen. i. 8); "made them His throne" (Is. lxvi. 1); from whence He "looked down" (Ps. xxxiii. 13); and makes them "declare His glory" (Ps. xix. 1). These all tell of mathematical skill and precision in His work; nothing being done at random. The Holy Bible also informs us authoritatively of another most important fact, that God not only owns but still preserves His property, for "the Heavens are the Lord's" (Ps. cxv. 16): from thence He contemplates the time before the Earth was created (Ps. xc. 21; John xvii. 5; Titus i. 2). The Holy Bible is the only book that could teach Man authoritatively that it is and is only by God's superintendence and His apportioning and regulating the centri-

fugal and centripetal and other forces of Nature, that star—planet—asteroid—comet—constellation and star group could keep the same orbit and place and be prevented from attracting and interfering with each other's motions or drawing them out of their appointed rôle in the Heavens.

The Holy Bible gives no clue to the date of the "beginning," which evidently indicates the commencement of God's physical Creation or Nature; and a period so far back in the eternity of the past that scientists and finite minds like ours admit their inability to compute or their imagination to grasp it, even if we could reckon its time length. The term "Heavens" includes the elaboration of Nature's countless suns and star-groups and their inhabitants.

The Divine narrative gives us no reason to infer that the Creation of the "Heavens" was an instantaneous process, but an exceedingly lengthy one; to give the Divine Architect time to develope His multiform designs, and far surpassing that of Earth, of which various Biblical quotations give circumstantial evidence that they were not immediate or instantaneous, but slow premeditated developments (Prov. iii. 9; viii. 20: Is. xlviii. 13: Job xxvi. 13; xxxi. 11; viii. 9: Ps. civ. 2). The third word of God's Holy Bible is both of deep astronomical and geological interest, because, like the "days" mentioned in the story of the Creation of our Earth (Gen. i. 19), it is evidently a term to be translated, not as earthly or time days, but as long periods, only in the present instance "beginning" means periods of infinitely longer duration than in the case of Earth evolution (Gen. i. 8). The term "beginning" of Creation, so understood, moreover clearly includes not one, but two, lengthy periods, viz.—

1st The true initiation of Creation, or pre-formative epoch when the Deity created and massed the spiritual, biological and physical materials from which He was to elaborate His countless and varied conceptions; and also those wonderful forces and laws by which He was to effect His marvellous works; and—

2nd. The formative, evolutionary or developmental epoch, when He began to create Archangel, Angel, Cherub, Seraph and His countless marvellous Spirit "Hosts of Heaven" (Luke ii. 13), that were created to wait on, serve, love and do His will. And then to elaborate sun, systems, orbs, planets, and all the many different forms of matter, animal and vegetable life; elaborations in which our Earth was included, whether as a final effort or not we cannot tell.

The former doubtless includes a long humanly incomprehensible series of Earth-years; and the latter, from the aggregation and appearance of the earliest star or star-group down

to the final elaboration of Earth and its settlement by Man, a period that may be humanly deemed an Eternity of years, incomprehensible to mundane minds.

The "days" of Earth-creation (Ps. xc. 4), long as they were and seem to us, are but figments of time compared to the periods included in the term "beginning," spoken of in the first verse of the Holy Bible.

Moreover, the Creator does not enlighten us as to which star or star-group was the earliest creation, and thus the oldest. Nor does He enlighten us regarding the order of their appearance in the firmament. Nor whether any—most or all—of them are inhabited: and if they are, by what class or kind of inhabitants. Or if any of their occupants have "fallen" like Man. Neither does He tell us in what part of the "beginning" He commenced to concentrate fashion and evolve the orb to us, the most important of all, namely, our temporary home, the World or Earth. Nor does He inform us at what period of its elaboration its animal copestone, Man, was first placed on its completely garnished surface. But at length this era, to us monumental, did arrive, and Man appeared upon the scene; and, further on, the Holy record gives us considerable information on certain astronomical points of the highest educational value and interest.

The Holy Bible ends its first verse thus, "and the Earth." As with the boundless realm of orbs and systems, so this infinitesimal globe of ours was created by Jehovah: a revelation of still greater personal import, as shewing that Earth and Man are only a part, and only a very minute portion of God's Universe. The Holy Bible does not reveal, nor can human science solve, the exact period of the World's birth. But it teaches that it was God who "appointed" and laid its "foundations" (Is. xlviii. 13); and did this systematically and with "wisdom," that is, care and deep thought (Prov. iii. 19). God "made" (Gen. i. 2); "framed" (Neh. ix. 16); or "created" (Colos. i. 16) Earth: and since then has "sustained" and "hung it upon nothing" (Job xxvi. 7); thereby manifesting power that Man can neither explain nor copy. The Holy Bible gives the reason for this; He owns it for "the Earth is the Lord's" (Ex. ix. 29). The term "laid its foundations" (Is. xlviii. 13) clearly implies a slow building up, and not an instantaneous or even a speedy creation, as once believed. This analogy applies to every other orb and star group. They were all slowly evolved. Scripture in this clearly endorses modern ideas, in believing that the myriad constellations and galaxies of Heaven were in turn, created gradatim and leisurely and carefully; and in all their departments material—vital—and spiritual.

We are indebted to modern science for the true interpreta-

tion of the Biblical term "days" (Gen. i. 5). These are not brief Earthly but long Eternity days (2 Pet. iii. 8). And also for explaining that the Creation and other orbs—suns—and star-groups were not immediate but slow processes of evolution and manifestations of Divine power and intellect: not miraculous, but according to the ordinary forces and laws of Nature. By thus supplementing Bible knowledge, scientists have done good service as exponents of Holy Writ. Thus read, the Holy Bible fully endorses modern astronomical science. The Holy Bible has thus been teaching and correcting humanity in astronomical knowledge for centuries. Thus, for ages, and until comparatively recent times, it was popularly believed that our Earth was the centre of Creation; and Man the chief or one of its chief features and its masterpiece. Likewise that the Sun, Moon and Stars were only created to give Earth their heat and light. This idea would never have been entertained had the first verse of Genesis been fully "received," and its tuitional revelation, that God made the "Heavens" *first*; and that the Earth's evolution was a subsequent—subordinate—and doubtless later manifestation in the general development of planets—suns—and sun-systems of every size and degree.

Of all books the Holy Bible alone and its Divine Author have been teaching Man for centuries how the stupendous system of Nature, to which Earth and Man belong, originated and was developed: thus giving the best proof that has been revealed of the existence and omnipotence of the Deity. Mankind might have guessed often, but wrongly, as the Heathen did, and still do: or if he had guessed aright he could never have felt assured of this, the vital fact of all astronomical science supplied by the Chief Authority Himself in his comprehensive and far-reaching educational handbook. Moreover, the Holy Bible is the earliest and only volume that can inform us that this mighty and elaborate work of Creation was scientifically planned and systematically—mathematically and methodically effected, with all the circumspection of an architectural Mastermind. The countless suns and star-groups and many different forms of matter were not made and then scattered broadcast and at random; but each attracted toward its own allotted centre, and given its special and definite orbit. The care with which all this has been done is Scripturally illustrated (Jer. x. 12; Is. xli. 12); indicating precise lines of thought and work. So that amid the countless starry hosts of Heaven there may be no jostling or jarring of colossal Creative forces—laws—or fabrics. Intervening distances are so accurately measured that no sphere, minute or mighty, attracts another unduly in circling round their axis, or each other, or round their supernal

centre. The harmony of Astronomical Nature is one of its greatest characteristics.

Ages ago did not the Deity point out in the Divine Book the possibility of Star classification, when He caused the Prophet to pen "He calleth them all by name; not one faileth" (Is. xl. 26); "He telleth the number of the stars" (Ps. cxvii. 4); thereby giving proof of His intellectual attributes and colossal memory, to supplement the proof which star-creation had already given of His Omnipotence. With us star-naming and classification are modern and still very imperfect. These sciences, so easy to him, are difficult to us. That He grouped the stars as we see them, in constellations and galaxies, is also shewn by His naming some of the more prominent; *e.g.*, the Pleiades (Job xxxviii. 31; ix. 9); Orion (Job ix. 9); Arcturus (Job ix. 9; xxxviii. 32); Mazzaroth, or the twelve signs of the Zodiac (Job xxxviii. 32); the "Chambers of the South" or Southern Star Groups (Job ix. 9); the "Crooked Serpent" or Dragon (Job xxvi. 13); betoken great familiarity with the subject. Moreover, are not the regularity, periodicity, definiteness, and, above all, the Cause and Author of some of the greater physical arrangements of earthly nature clearly taught in the Holy Scriptures when they declared that "He appointeth the Moon for Seasons" (Ps. civ. 8); and, again "the Sun knoweth his going down" (Ps. civ. 19). By these the Holy Bible teaches the cause of the yearly changes in the Physics and Life at and near the Earth's surface, known as Spring—Summer—Autumn—and Winter; and explains the reason of day and night.

By speaking of the Stars in their "Circuits" (Job xxii. 14) has not the Holy Scriptures been for ages pointing out inferentially that they are not really "fixed," as once scientifically and even now popularly supposed; but one and all, stars—constellations and star-groups alike, constantly moving onward and circling round some great and doubtless identical centre. Our Sun is travelling onward at the rate of at least four or five hundred thousand miles a day, carrying its children planets with it. Mœdler affirms that the focus round which the Sun circles is probably the Pleiades, especially its central star, Alcyone, elsewhere spoken of. Sirius, one of the two brightest stars in the Northern Sky, is also moving onwards, doubtless in a circle, at the rate of one million nine hundred thousand miles per day. Doubtless every star and star-group in the Universe, large and small, is similarly gyrating round some and probably the same focus; the centre of gravitation; sole region of celestial tranquility and peace, where attraction and gravitation cease: and where probably the Creator of all dwells chiefly and has His throne.

What and where that wondrous and mighty pivot of Creation is, involves a very significant conjecture and sublime suggestion, namely, regarding the Divine Being, "for whose pleasure they are, and were created" (Rev. iv. 11). This idea of a great universal centre of Creation must be associated with Job's mysterious and pregnant query, "Canst thou bind the sweet influences of Pleiades" (Job xxviii. 32); and that, again, with the above-mentioned discovery by Mœdler of a peculiar dark orb in that noted constellation, which has led him to suggest that this body may perchance be the supernal centre of all things, Jehovah's throne and chief dwelling-place (Ps. cxxiii. 1), an orb which emits no light and of which He alone is the sun (Rev. xxi. 23; Rev. xxii. 5); where He reigns over the vast Creation He has called into being. If this is so, Earth is honoured by belonging to that star-group, the Milkyway, which is Nature's great centre, round which the Mighty Maker and Sustainer of all things, in other words Creation, revolves in completest harmony; does His will and fulfils His beneficent purposes. His special abode is perhaps one of those things which Jehovah does not intend Man to discover with perfect assurance; for who can "by searching find out God" (Job xi. 7). And "is not God in the height of Heaven" (Job xxii. 12): is not His "throne in Heaven" (Ps. xi. 4; Job xxiii. 9). He "holdeth back the face of His throne and spreadeth His clouds upon it" (Job xxvi. 9). But, has not He endowed Man with an enquiring mind; and is it not, therefore, our privilege, if not our duty, to endeavour to find out all that is permitted. What Christian is there who does not often exclaim with Job, "Oh that I knew where I might find Him, that I might come even to His seat and order my cause before Him" (Job xxiii. 3); and then and there have the gracious privilege of "touching the hem of his garment" (Mat. ix. 20; Mat. xiv. 36).

The Holy Bible contains manifest highly suggestive allusions to Eclipses, and especially their more obvious phenomena. Thus "the Sun goes down at noon" (Amos viii. 9; Micah iii. 6; Zech. xiv. 6; Joel ii. 10; xxxi. 34; Jer. xv. 9; Mat. xxiv. 29). Some of these poetically expressed figurative allusions may refer to eclipses which these Prophets witnessed and which are known to have occurred, especially those of Amos and Micah in B.C. 784 and 716; and Jeremiah's to the eclipse of B.C. 610. Comets also may be alluded to in Luke xxi. 25. Job, whose era is uncertain, but whom some aver lived between Peleg and Abram, and others that he was Moses, and the book the outcome of thoughts generated in the silence and solitude of the Midian Desert by this highly literary and philosophic mind, capable of putting these into terse, beautiful, vigorous and impressive language; this Patriarch, suppositious or real, gives

several illustrations of early astronomy; and not only shows its wonderfully advanced state, but puts many suggestive queries shewing that the book of disputed authorship was written by a most advanced and scientific mind, moved by thoughts of the deepest nature.

Some, regarding our modern Biblical tuition and advanced astronomical knowledge may regard these Scriptural selections as exceedingly elementary instruction; but they are one and all vital points; and were both advanced and important in those unenlightened early days of mankind, when they lacked accurate information, and were so apt to reason wrongly and idolatrously regarding what they did know of Nature. Can we doubt that these facts were divulged to instruct our early kindred in the higher educational matters, and incite them to study the fascinating, elevating and suggestive sciences more fully? Are they not equally tuitional for the masses now?

Biblical Geology

Of all the sciences this is one of our most recent studies: although the Holy Scriptures clearly antedates these by centuries: for Moses includes and initiates it in his account of Creation given in the first chapter of the Pentateuch; and shews so intimate an acquaintance with the subject that it must have been revealed to him; because Geology was not a study of either his or previous ages. For no human essayist, in elaborating a new science like this, and only a skilled and supernal Physicist and Geologist like the Divinity could or would have written so condensed and systematic an account of what is clearly meant for human educational enlightenment and an incentive to further research. The Holy Bible has been teaching the chief fundamental facts and outlines of this science, and pointing out the great creative acts carried out on Earth, and in strictly accurate chronological sequence for ages; and long before the days of Smith, the "father" of Geology, and ere our Nineteenth Century science was even dreamt of. The minutiæ of the birth and elaboration of Man's special orb-home, the Earth, is more fully given than that of the Heavens generally (Gen. i. 1); because of its special interest and import to humanity, and to give it as a type of what methods have been followed elsewhere in orb-building, and as shewing the excessive and herculean care taken in its slow and lengthy, but thorough elaboration, to make it a fit abode for living things, especially the copestone, Man (Gen. i. 26-31); a fact which modern Geology fully confirms. This complex and slow process no doubt began at some long distant period, while the Divinely versatile Jehovah was elaborating the vast and stupendous realm of Nature. But the exact date when the

comparatively insignificant yet exceedingly interesting and important orb which God Himself named Earth (Gen. ix. 1), and the World (John viii. 12) was begun, is not divulged: nor even that of our Parent central Sun, or Earth's sister planets and other appanages of that luminary; Earth being merely a comparatively insignificant appanage of the Solar system; and the latter, as a whole, a galaxy of no great apparent import among the Stars and Star-groups of Heaven.

In the masterly epitome found in the first chapter of Holy Writ we read of what Geologists tells us must have been the unusually distant "beginning" when the "Heavens" came into being geological laws were formulated and forces initiated. And, as one of the incidents in this stupendous evolution, of a time when the "corner-stone" of our World was laid, that is—Earth evolution begun (Job xxxviii. 6) and the World's birth accomplished, to commemorate which "the morning stars sang together and all the sons of God shouted for joy" (Job xxxviii. 7). Scripture does not enter into the very earliest stages of Earth-evolution, or tell the sequence of events of which modern Geologists inform us: such as the attraction, gravitation, concentration and amalgamation of interstellar matter to form our great central Sun; its subsequent incandescence; the shedding of the planets from its semi-molten surface; and among these our Earth; and then from the latter the similar birth of the Moon. The Holy Bible only informs us that the Earth was once "without form and void" (Gen. i. 2), *i.e.*, destitute of life and living things. But it enlightens us regarding an all-important fact of which no scientist of any age could inform us, namely, that these stupendous events and creations did not spring from any inherent power in matter or in Nature per se, and that Nature is not self-existent; but that the Heavens and the Earth, like all else (Colos i. 16) were created by God; not the imaginary and "unknown" God or Gods of the Heathen, but the one—only—true—ever active and potent Deity Jehovah. Some of the earlier physical phenomena in Earth-creation are spoken of in the Mosaic account; such as the appearance of light—of night and day—the separation of land and water: followed in turn by allusion to the more elaborate vital phenomena, such as the evolution of the vegetable—then of the animal world—and, lastly, Man. Modern science has done good service in pointing out that the "days" in which these different creations were made and Cosmos elaborated from Chaos were not our puny ones of hours, but Divine and long periods of time (Ps. xc. 4 ; 2 Pet. iii. 8). And also that neither were the creation of plants—animals—Earth—or the Heavens instantaneous processes, but gradual—careful and methodical ones after Divine methods according to the usual marvellous and developmental forces of Nature and its Maker—God.

Bible students not conversant with Geological; and Geological ones unfamiliar with Bible lore, or anxious to discredit the Book because sceptically inclined, have found it difficult to reconcile the modern Geological and ancient Mosaic records of Creation. But yet many noted as much for being devout Bible students as that they were practical scientists, have found no such difficulty. And recent discoveries in God's great and mysterious stone-book of Nature, instead of contradicting are found to closely agree with the Mosaic data. The two really endorse and corroborate one another in the main. And the apparent discrepancies of the present will no doubt disappear in the light of further secular research, and shew how correct is the Bible record of God's stupendous creative world-architecture.

Again, even as the Holy Scriptures have long been educating us as to the World's birth; so it has also regarding its death. For when the Apostolic fisherman Peter predicted the Earth's destiny by stating that it is "reserved unto fire" (2 Pet. iii. 7); he gave a curt yet graphic description of a not imaginary but coming catastrophe. That the "day of the Lord will come as a thief in the night, in which the Heavens shall pass away with a great noise and the elements melt with fervent heat; the Earth also and the works that are therein shall be burned up" (2 Pet. iii. 10) is a prophecy which anticipates by nearly two thousand years the deductions of modern scientists, including some who deny the inspiration of Scripture, but whose studies, nevertheless, unconsciously bear testimony to the remarkable coincidence between Biblical assertions and the conclusions of science.

Modern Geologists believe that the Earth, which originally came from the widely diffused attenuated matter of the star-depths, and was once a fiery globe, like its parent Sun, is likely to have a fiery end. Centrifugal force will in time be more than counteracted by centripetal; the matter not only of this Earth but of the entire Solar system, is even now tending by the attraction of gravity, towards the great central luminary round which it revolves in a series of spirals, so that every planet and moon and meteorite within its realm is slowly but surely creeping toward, and must inevitably fall ultimately and in turn into that Star, the heat and light of which are supposed to be largely due, even now, to this constant gravitation towards and fresh addition of combustible matter: a fate to which our Earth must ultimately contribute its abundance of highly inflammable elements. The analogy might be carried further, to prove that the humanly countless galaxy of Stars is not more immortal than is the Earth or the Sun, but will ultimately pass away, as Brewster suggests, like a scroll (Is. xxxiv. 4; Rev. vi. 14) when

their rôle and destiny are accomplished. When that occurs, solid matter, now so much in evidence in creation, will be once again, as of yore, an accident in Creation, and secondary to Nature's ruling element and power, Spirit.

Earthquakes and their awe-inspiring phenomena are often spoken of in the Holy Bible (Judg. v. 4; 2 Sam. xxii. 8; Ps. lxxvii. 18; xcvii. 4; civ. 32; Am. viii. 8; Heb. iii. 10; Joel ii. 10). The destruction of Korah and his rebellious company was doubtless caused by an earthquake fissure (Numb. xvi. 32). In the reign of Uzziah earthquakes are mentioned (Am. i. 1; Zech. xiv. 5; 2 Chron xxvi. 16). From Zech. xiv. 4 we may infer that there was a great earthquake which split the Mount of Olives so as to leave a valley between two summits. Again, it was evidently an earthquake which occurred during the Crucifixion (Mat. xxvii. 51-4).

Biblical Physics of the Air and Ocean

The Physics of the Air and Ocean are also Nineteenth Century sciences, and still very immature and imperfectly understood, even by students: while the laity is often entirely ignorant even of its most elementary facts. For example, how rivers are supplied with water; why the Ocean does not overflow by constant addition; how it retains its saline balance. Yet the Holy Bible has for centuries explained these elementary educational facts to deaf ears. As in other matters, much early meteorological ignorance would have been avoided had God and His Bible been better known, understood and trusted in such scientific matters as these.

Early Man was not left in complete uncertainty regarding the aerial or wind currents or the circulation of waters, including river and ocean tides and highways, since both are shadowed forth in the utterances of Solomon. These are matters of moment, not only for commerce, but still more for the hygiene and health of their animal and vegetable productions, and also those of Man. Ages before the law of storms was studied, a matter of comparatively recent date, the God of Nature had indirectly penned a synopsis of the fundamental facts of meteorological and climatic science, the germ of the philosophy of to-day, with which our human theories are found to closely correspond. Modern research does not refute but only endorses the veracity of the ancient Bible, and proves what Scripture long ago pointed out, that the "wind goeth round the South and again unto the North; it whirleth about continually, and the wind returneth again according to his circuits" (Eccles. i. 6). The many different varieties of wind that prevail in different parts of the Globe, Monsoon—Trade—Cyclonal or variable,

with their upper and under, direct and counter currents, do not come and go by chance as once supposed, and as the ignorant still believe; but everywhere blow according to laws, definite, though still imperfectly elucidated, but not the less certain and definite. So also the sacred text in highly poetic phrase clearly explains the physical geography of the waters that cover the Globe. And long ere Maury's invaluable pioneer researches we find them and the germs of modern meteorology shadowed forth; and the phenomena of rain, river and ocean circulation given in the writings of Solomon (Eccles. i. 7). And also the explanation of what was once a puzzle, namely, why the sea never overflows by the constant and copious addition of rain and also river-water; "all the rivers run into the sea, yet the sea is not full; unto the place whence the rivers came, the mountains, thither they return again" (Nahum i. 3-6), by evaporation and subsequent condensation and deposition in the form of clouds, mist, snow and rain, to rejoin the ocean by rivers and lakes and preserve the balance of saltness (Eccles. xi. iii.). For "He causeth the vapours to ascend from the ends of the Earth" (Jer. xi. 13), *i.e.*, the far-off equator, where ocean evaporation is constant and copious, to make soil-fertilizing rain in the regions to which the wind carries them: "the Lord is His name that calleth the waters of the sea (by evaporation, mist, fog, &c.) and poureth them out on the face of the Earth"; by condensation into rain. And "He watereth the hills from His chambers," the upper air, to form commerce favouring streams, river, lakes, &c. (Ps. civ. 13), and thus restore fluid formerly evaporated, and keep the saltness of the sea at par. In these Biblical utterances we have a cycle of balancing processes, all tending to definite ends; and by correlation fully explaining the above mentioned popular queries of the present day.

Various other meteorological and physical phenomena, illustrating the ordinary operations of Nature, not so much to explain their cause as to point out their Author. For example, the electrical ones of Thunder and Lightning; the former rare in Palestine in Summer, being figuratively and poetically termed His "Voice" in the imaginative philosophy of the Jews (Job xxxvii. 5; xxxvii. 24-5; Ps. xviii. 13; Is. xxxi. 30-31): and the latter His arrows (Ps. lxxvii. 17). Heat—light—wind and storm are called His "Messengers" (Ps. cxlviii. 8). Thus the Biblical meteorological allusions are often suggestive and always educational: and other instances might be given to shew that, as with other sciences, how advanced this study might have now been by earlier attention to what the Holy Bible has been long telling mankind regarding it, as a basis for further study.

Biblical Chemistry.

Chemistry, that science which plays so important a part in the physical, vegetable and animal worlds; and which in the latter two, with physics and vitality, may be called the Tripod of life, not only in our Earth but over the wide Creation, is often and forcibly illustrated in Holy Scripture. Thus so early as the days of Tubal-cain, 300 to 400 years after Adam's (Gen. iv. 22) creation the first expert and "instructer of every artificer in brass and iron"; a title which indicates an ability to soften —melt—work and combine the metals, and proves an early acquaintance with advanced practical Chemistry; and that the early race of that period were not savages; and is educationally recorded in the Holy Bible to shew what they could accomplish then.

Later on by 20 centuries, when Jehovah said after the Flood, "Behold I put my bow in the cloud" (Gen. ix. 13), the fact was memorable not only as a beneficent promise but as a prominent Chemical revelation, by enshrining and illustrating in the "Spectrum" thus disclosed those "lines" first humanly discovered by Fraunhofer, Wollaston and Brewster during the present century and destined to form the basis of Spectrum Analysis, by which the chemical composition of the far-off starry Heavens is now being methodically investigated, to shew, broadly speaking, that the composition of the Stars—Star-groups—and wide Creation is not materially different from that of our own Earth, as analogy might lead us to infer, since all were derived from the same source, the so-called interstellar Æther: a modern discovery that may possibly lead to results the importance of which we have yet little conception.

Later on by eight centuries, the burning of the Golden Calf, stamping and reducing it to powder by Moses, were clear proofs of the deep acquaintance of this Genius "learned in all the wisdom of Egypt" with Chemistry (Deut. ix. 21; Ex. xxxii. 20). During the Wanderings, when Jehovah rained Manna from the atmosphere daily for forty years on the Hebrew Camp, did He not thereby give mankind a practical illustrative hint and example of the possibilities of human synthetic chemistry? the fulfilment of which is now within sight in the likelihood of the early production of human food for the multitude, as suggested by the President of the British Association (Div. 2, Chap. 2; Food—Manna). Still later, when the Holy Bible tells us that God "weigheth the waters by measure" (Job xxviii. 25); "measures the waters in the hollow of his hand" (Is. xl. 12); "weighs the mountains in scales and the hills in a balance (Is. xl. 12); He not only intentionally points out His might

in highly poetic garb, but also clearly and educationally anticipates and reveals the modern Atomic Theory by centuries: Dalton's, a chemist of last century, great modern discovery; the law of the chemical combination of solids, not at random, but by atomic proportions; and of liquids and gases by volume; thus making these sublime words; once deemed a mere flight of the imagination, the embodiment of a great and true scientific fact, and index, both accurately and poetically expressed of the great chemical law on which that mighty and universal science is based; not in earthly chemism alone, but in that of the wide Creation. The two gases, Hydrogen and Oxygen, that form the main element in that universal and vital chemical fluid, water; and the different solids of which the Earth is composed are united in the same definite proportions, no matter what their bulk may be. A drop of water shews the same relative quantities of these two elements as the mighty ocean: and a hand specimen of rock the same proportionate elements as the "everlasting hills." The scrupulous accuracy of Nature's universal and colossal chemistry is even more evident in these wonderful processes by which inert earthy matter is year by year resurrected by the inherent vitalizing power of minute germs or seeds, and converted into countless new—beautiful—varied and useful forms of vegetable life; most prominent among the uses of which is that by which we literally see "stones made bread" (Mat. iv. 3). Nor does this climax Nature's amazing chemical fertility, since it is only a transition stage towards their further and still more astonishing reconstruction into even more numerous—elaborate and strange forms of that higher kind of life which comprises the animal world; each variety—as with the vegetable world "after its own kind" (Gen. i. 24): with tissues and organs possessing not only the same unvarying chemical composition but even microscopic structure; the same physical properties—characteristics and uses; and—more wonderful still—each capable of transmitting its special individual virtues and endowments as a hereditary legacy to its successors *ad infinitum*; results which baffle the skill of the very ablest human efforts. Year by year the vegetable and animal worlds, and even mankind repeat themselves in their progeny; but there is no change evident in their chemical composition or characteristics.

Biblical Botany

The Botanists of earlier days might have learnt from Bible study; so often, as in this instance, anticipative of far later botanical research. The special Botany of the Bible, which forms quite a literature, is beyond our theme. In Genesis we

find the first arrangement of the vegetable world; namely into grasses—herbs—trees and fruit trees. The wise Solomon later on spake of trees and plants; from the huge cedar to the small hyssop on the wall (1 Kings iv. 33): Solomon was evidently a more thorough Botanist than Moses or Adam. Linnæus, during the Nineteenth Century, was the first in modern times to devise a thorough and systematic arrangement of plants. This was based mainly on their reproductive organs. But even its author was satisfied that his so-called "artificial" system was imperfect, and wished for a better. This was supplied during the Nineteenth Century, when de Candolle gave us the "Natural" system, which classes plants according to their essential organs, the growth of the stem, and number of seed leaves. The unnecessary trouble which Linnæus took in constructing his system, and the discovery which he missed, had he employed the key ready to hand, and thereby anticipated his fellow Botanist and reap the glory which the latter claims, is worthy of notice. How strange to find that this truer, though more abstruse and difficult arrangement has been clearly outlined for ages in the Mosaic record of Creation (Gen. i. 11-12) in which the nature of the seed—fruit—leaf—size and character of the plant are the recognised distinctions. Again, as an additional instance of Biblical priority, the part which the leaves perform in the construction of the trunk of the tree is also supposed to be quite modern. Yet is it not foreshadowed and the physiology of exogenesis truthfully taught in the Bible "as a teil tree or as an oak whose substance is in them when they cast their leaves" (Is. vi. 13)?

Biblical Zoology

Jehovah has intentionally put much information in His Holy Word regarding His Works, to incite us to their further study: and notably much regarding Natural History or the study of living Nature; a subject so often mentioned as to form a literature of itself. So that if every individual knew the whole intimately, he would be deemed well informed on that special subject; especially as nothing Divine can be antiquated or obsolete. Jehovah's object in this is clearly educational and illustrative; so that this pursuit is laudable and not beneath the dignity of learned leisure and prominent men like Adam (Gen. ii. 19), Moses (Acts vii. 22), and Solomon (1 Kings iv. 29-34). The Biblical are the earliest Zoological classifications and the first to be turned to practical account in the Hygiene and the Dietetics of the Mosaic law (Levit xi.): and on these our modern classifications can only enlarge by further sub-division. Here the Divinity is the leading Biologist and Classifier of His

own Works, and Animal Kingdom. But His pupil, Moses, was also doubtless learned in the Natural History of his day as in all other Egyptian lore: and at Sinai had a later lesson in Philosophic Classification, which he doubtless received gratefully and humbly, like other manifold proofs of Supernal Wisdom; as he also did the application of Zoological lore as a guide to the judicious selection of human food. His mastery of both subjects is shewn in the Pentateuch (Lev. xi.; Deut. xiv.). Though over 3,000 years old, and humanly-speaking ancient, this Biblical classification of animals is into edible and unobjectionable (Lev. xi.; Deut. xiv.)—quadrupeds which are cud-chewers and cloven-hoofed or foot-parted or not, from those non-edibles which go on their paws, which includes predatory beasts. Non-edible predatory birds are also grouped apart from the clean or edible domestic varieties, the vegetable feeders. Fish are classed as those with and those without fins or scales. Creeping animals, as the lizard—serpent—and tortoise are also differentiated from others; also centipedes; and other many-footed insects, which both leap and fly; and also flying insects with leaping legs. This, both from a Zoological and Dietetic point of view, agrees perfectly with modern views. In both respects the Mosaic classification was instructive and educational; nor has modern research cancelled it.

Though Moses, the God-enlightened, was the chief Biblical Zoologist, Adam, equally God-taught, has a priority of knowledge of Zoology; at least of the animals of his district; which he named; the names doubtless coming to him like speech. We learn nothing from this as regards this science: and the fact is chronicled mainly to shew future generations that his knowledge was Heaven-instilled, and that he himself was no savage or high-class anthropoid, but highly intellectual and a special creation and lord of the animal world. But even from these early times we glean scientific information that is interesting. For Adam gives us the elementary facts of Zoology and the earliest division of animals; namely, into beasts of the field; fowls of the air; fish of the sea; and reptiles or creeping things (Gen. ii. 19); which comprise the four great divisions of the vertebrata.

Noah, by his experience in the Ark, must also have become deeply initiated in local Zoology (Gen. vii. 2; viii. 20). Solomon likewise included Zoology as one of the items of his wisdom, for he, too, was a Naturalist, Zoologist and Botanist (1 Kings iv. 33): although he has left no scientific, and only literary remains. But, from the specimens of the latter in Proverbs, Ecclesiastes, &c., we may be fairly assured that his knowledge of this was great. As of plants, so he spake of

beasts—fowls—creeping things and fishes (1 Kings iv. 33). The fact of this gift being recorded to teach subsequent students that Natural History then, even as in the very earliest days of mankind, was a favourite and by no means ignoble study; with a view to incite future peoples to follow.

Biblical Ethnology

Ethnology and Anthropology secularly are recent or Nineteenth Century sciences; by which the numerous varieties of mankind have been divided into three great classes, the Caucasian—Mongolian—and Ethopian. But we have only to turn to the educational information of very early Scripture History to find Ethnology fully outlined, and these secular conclusions not only verified and anticipated by Jehovah's servant and savant Moses over 3,000 years ago; but supplemented and completed by having their origin and descent traced back to the sons of Noah—Japeth—Shem—and Ham. Nay, the Bible record does far more and carried the genealogy still further back by tracing these to their common genetic centre and source—the primal pair, Adam and Eve; which no purely secular authority, ancient or modern, can do. In Christian eyes the Biblical story of Man, written like no other history by men inspired by our Divine Maker is strictly true. Our real genealogy is one of the most universally important and interesting of subjects.

But God's Holy Bible does still more and goes still deeper into the early story of Man by telling us who created him (Gen. i. 27), and why (Gen. i. 26); also the circumstances under which this occurred; explaining what human beings really are (Gen. ii. 7); telling us what our past and present place in Nature is; why he lost his first estate; and how this is to be regained. These are subjects that can be found mooted and answered nowhere else; and that can be solved by no other authority, though of the very highest import, and the foundation of all education as an essential preliminary to the study of human hygiene in its widest aspects. Jehovah is the best and safest informant regarding all that concerns humankind; and those of His Holy Scriptures far ahead of any secular findings.

Modern science, in demonstrating the unity of the many different races of men, and proving their descent from one genetic centre, as deduced by anatomical—physiological—psychological and linguistic research, has only confirmed the Mosaic dictum long since laid down by Scripture, but also the later one, in the missionary sermon of St. Paul upon the Aræopagus of Athens, when he proclaimed to its scrupulously

reverent townsmen that "God hath made of one blood all nations of men, for to dwell on all the face of the Earth" (Acts xvii. 26). These important facts were taught by Holy Scripture since the days of the Wanderings; though they were long, as they even yet are, looked upon with suspicion, for reasons given elsewhere.

The origin and birth of Man is one of those questions which the Creator has given in language which may be construed in different ways, doubtless for educational purposes, and with a view to cultivate his intellectual powers by scientific investigation and also his faith. The question is by no means settled yet by scientists, and has led to disputes and even scepticism.

Some savans have endeavoured to account for the different varieties of mankind by the idea of different and, perhaps, previous genetic centres besides the Adamic. But this the Bible narrative seems to wholly discountenance; as it only speaks of one, namely the Adamic, to which it gives special prominence and details minutely as the only one, never even hinting at others, as it would likely have done had it been so; and distinctly pronounces Man to have been specially made after the Divine "image" (Gen. i. 27), and to be all of one blood (Acts xvii. 26), as if to finally settle the question and prevent further and future dispute.

Nor does the Holy Bible seem to give any countenance to the idea that Man is merely an elaboration of the Anthropoids developed by evolution, and a gradually ascending complexity of structure, combined with a natural survival of the fittest forms of life, by crowding out the weaker and the inferior. Evolution, or development, may be of two forms, thus,—

1st. The Darwinian, in which the process is slow and caused by vital powers implanted in the animal or plant.

2nd. That which goes on *per saltum*; new forms arising as fresh ideas spring in the mind of the Creator or His deputies (Gen. i. 21; Psalm ciii. 21; John iv. 34; v. 30; Heb. i. 7). This, unlike the former theory, does not leave wide untenanted and unexplainable gaps.

Both necessarily imply the exercise of Supernal powers and are Divine. But which of these was followed as the animal and vegetable worlds were evolved from the very lowest types, the Bible record leads us to conclude that the latter was the mode by which the first pair of Man was originated; and that,

1st. They were a special and high creation, made in the likeness of the Maker, because meant to be the earthly copestone.

2nd. Widely separated and far superior to the very highest of the lowest animals, anatomically—physiologically—intellec-

tually, and, above all, spiritually, by possessing a soul and an eternal heritage.

3rd. Not primarily of savage but of an intellectual type.

4th. That the world was evolved or developed in six creative "days" or long periods of time; Creation proceeding by a law of gradual advance, beginning with inorganic matter (Gen. i. 2-10); then plants (Gen. i. 11-12); animals (Gen. i. 20-25); thus advancing from the lowest to the highest organisms and up to Man, the climax and copestone and most elaborate of all.

5th. That Man was the being for whom this world and all things in it was designed. He was this world's crown—and roof: created in God's "image" and "likeness," *i.e.*, after the Divine design and pattern, as regards intellect and other mental attributes. He is the only one of all Earth's animals which possesses a spiritual nature or soul, capable of holding direct intercourse and communion with Him. The tree of life (Gen. ii. 9; iii. 22), of which we know nothing, possibly acted as a medicine or vital elixir, by the occasional or continuous use of which Man, not created immortal, was revivified and thus preserved from death. But the Holy Scriptures do not inform us definitely, although they decidedly lead us to infer, that He was the copestone of a series of special creations of gradually increasing complexity.

6th. Or the only special creation of a series otherwise developed; *e.g.*, by evolution of the Darwinian kind.

7th. Many still believe that Man is the copestone of a creation developed throughout by selection of the fittest and the gradual evolution of higher from lower forms of life: and is a form which the Creator honoured by implanting His spirit in him, and thereby creating him in "His image," to be at once His servant—companion—and perhaps to perform other special and higher purposes.

8th. The teaching of Scripture appears to be that humankind sprang originally from one primal pair, Adam and Eve, both specially and miraculously created by Jehovah (Gen. i. 2) as the last of His earthly creations. Geological investigation seems to abundantly prove this.

9th. Biology countenances what Scripture avers, by shewing that there is a long gap—anatomically—physiologically—intellectually, and especially in the central nervous system, between the highest Anthropoids and the lowest races of Man: a gap which has not yet been bridged over.

10th. Palæontology, which imprints even the softest animals and plants of pre-human ages on the rocks, or preserves the skeletons, skulls and the hard bones of the higher mammals, has yet found none to aid it in bridging over the developmental

gaps between the Anthropoids and fully-developed Man.

On these different points modern scientists have not yet fully agreed. But it is noteworthy that the Bible account is such that it might suit them all. But, at the same time, it seems most to favour the idea of a series of special creations throughout Nature, Man having been the climax. But whatever may be the final decision, it is certain to agree with Holy Scripture.

Another still unsettled question is as to the antiquity of the race. Is this comparatively recent, as the Holy Bible states; or more remote? In this geological science seems to corroborate Scripture by making him comparatively recent, and placing him not before the diluvial epoch and the seven or eight thousand years given by the Holy Bible. Had he been older would not his ivory-hard cranium and long bones have been palæontologically preserved in the rocks; like those of still older extinct animals, and his geological age been thus chronicled?

Another mooted question regarding Man is this: are the lengthy ages assigned in the Holy Scriptures to Adam and his immediate descendants, correct or not? for example, that of Methuselah, the oldest, who is said to have died aged 969 years? In short, do not the chronologies of Hales, Usher, &c., require reconsideration and revision. These form the chief points of discussion regarding Man, between secular science and Biblical lore. Thus far Humanity still lacks a master-mind capable of correlating apparently conflicting ideas; reconciling seeming discrepancies between this part of God's Work and His Biblical description of it. But the advent of such a Mind, come when he may, will doubtless only be to prove that the oft and long misjudged and despised Bible is correct: and that Man is sprung neither from a monad—an ape—or a savage, but for progenitors had two highly civilised and intellectual human beings; a model man and woman, paragons primarily in every respect, physical—physiological—social—mental and spiritual. Tradition and the science that studies it bears largely on Ethnology and the early story of Man. There are three prominent traditions found more or less in every race and era; handed down from generation to generation, though in different versions: and preserved among people so widely separated in latitude—longitude—civilization—speech—creed—and colour, that they must have a foundation in fact; historical fact which the Holy Bible supplies. The legends now alluded to are those of Paradise—Man's Creation—his fall—and the story of the Deluge. It is strange that these and the Holy Bible should corroborate one another so closely; one thus proving the other to be true; Scripture thus removing the other from the realm of legend and fiction. Evidence of Bible verity from heathen tribes and from such as never knew the Holy Scriptures!

The latter thus simply tells and historically preserves the true ancient records of our race; designedly to preserve them in their verity and prevent their further departure from the strict accuracy so dear to the God of Truth and His Holy Word. The simple Biblical version of these great historical facts is the true and authoritative one.

No matter whether the Deity permitted Genesis to be compiled by His amanuensis Moses, from his own direct revelation, or—as the Belgian Physician Astruc suggests, by being based on a collection of older documents or traditions, oral or written by authors, variously estimated from one to twelve in number, it seems very unlikely that the Deity, in the former case, would mislead both Moses and the human race; or, in the latter, permit them to be misled on such important topics. Like the earliest Bible—the Pentateuch as a whole, so its earlier chapters, descriptive of the Creation of Nature—the Earth—and Man, are not merely a collection of ancient fragments loosely collected and connected, but a carefully and truthfully composed revelation of the utmost educational value to mankind, because Divine and unique. The Holy Scriptures, and these alone, furnish mankind with the most important of all Ethnological facts, namely, that the original pair, and, therefore, their progeny, were not altogether earthly but mainly Divine (Ps. viii. 5; Heb. ii. 7-9).

Biblical Philology

Philology, or the science of language, was little studied till the Eighteenth Century, although the Deity has been instilling its rudiments and base facts and its essentials for thirty centuries in His earlier Bible—the Hebrew Pentateuch. Of late, however, great advances have been made in its secular study. In this the conclusions of some agree with Holy Scripture, while others do not. The chief conclusions of Philologists are, that there are or have been 1,500 distinct languages and some 3,500 colloquials or dialects; that is a total of from 4,064 to 5,000 different forms of speech. About 600 of the primaries are dead; and only about 900 languages are now spoken and 2,500 colloquials. English and German are the last formed. No new ones are now being made. As the world fills, languages must disappear. The Holy Bible is materially promoting this; as it will lead back to English; destined to become the universal language. Philologists also tell us that Hebrew is a very limited language; and contains only about 7,000 words. Whereas English has now about 80,000; in which there are 1,000 Hebrew roots. The Philological analysis of these world languages is still more wonderful. By critical analysis these have been divided into families, each shewing direct relationship.

Still closer investigation has reduced these language-families to two groups, viz., the Indo-European and the Semitic. These two were at first apparently so distinct that the gulf was deemed too wide to be bridged. More lately, however, points of resemblance have been discovered in these; pointing to a still older language; the common origin of all, and mother tongue. This is the most that has been effected by modern Philology: but it testifies largely to the original unity of language; therefore of humanity; and its spread from one and not from several genetic centres (Gen. xi. 1-9).

The Bible story thus turns out to be credible. Modern research thus confirms ancient revelation so far. But here the latter takes up and completes the story where the former stops; supplements and completes it; and educates us further by giving Philological science the clue to when—why—how—by whom and where the primitive tongue was confounded and split up; languages infinitely multiplied and the race widely scattered, because unable to mutually converse. One and all of these are facts of deep educational import, not only for earlier times and peoples but for the present day. What, therefore, is the Biblical story of language and its Philological teaching. Christians will receive this freely and fully because it seems incredible that God would tell Man, or permit him to be told, erroneous facts regarding his early history and language. The Holy Bible indicates that speech was coeval with Man's creation. It began with Adam, and, like all else, was the gift of God. Speech was one of those endowments that distinguished him then as now from the lower animals. When created he had not to be taught to speak. It came naturally to him, and at once, as it does now more slowly to the child. It was one of Man's implanted instincts and endowments, which he could neither invent, prevent, nor control. It came as easily to his tongue and mouth to speak as to the latter to eat, his hand to grasp, eye to see, ear to hear, tongue to taste, arms and limbs to move. The faculty of speech and capability of conveying ideas from mind to mind by vocal sounds was born with him and was part of his being. We cannot yet affirm what was the primitive language. Some believed it was Hebrew. But the Bible story implies one primitive language for the sole initial race.

But the Holy Book enlightens us still further by telling us *why* so many tongues now prevail, and confirming the truth of the universal tradition of the early confusion of language and dispersion of mankind, as a punishment to widely separate the rebellious descendants of Noah; so as to multiply and replenish the Earth by becoming distinct tribes and nations. The cylinder of Birs Nimrud gives independent testimony and

corroboration of the Biblical account of the cotemporaneous confusion and dispersion. The number of languages that now prevail and the resulting antagonisms of Humanity prove how "perfect" was God's remedy for racial rebellion, and that, like all His Divine efforts, this was done thoroughly. The momentous incident at Babel was doubtless caused by a miraculous and more or less instantaneous forestallment of those dialectical differences of language which are even now in constant progress. But yet, though many different languages was the result of the Divine intervention, the elements of the original tongue and the substratum common to them all doubtless remained, disguised by variations of pronunciation and new combinations, so as to be practically obliterated and undistinguishable save by the deepest modern philological students. For, widely as languages now differ in external form, the basis from which they all sprung appears by philological research to have been in all cases the same; and the roots in all identical: evidence being apparently nigh at hand to shew that the several families will ultimately be reduced to one parent or primitive speech, which remained intact till the Flood in the days of Noah—Shem—Ham and Japeth, and thence on to the disruption at Babel. Like races, so languages, both many and varied, are being massed and grouped by scientists into a few large groups. These, in time, will no doubt be historically massed into one. Thus we can point to one primal race and one primary language. The testimony of modern Philology to the original unity of speech, testifies to the original unity of the human race, and to a single genetic centre. Philological science teaches us much; but Biblical Philology keeps it within the bounds of verity and credibility. Biblical utterances are thus not only pioneer in Philology, but have done more to advance—complete—and explain it than any thing modern and human. Some modern scientific affirmations differ from this, however, and try to prove—

1st. That the acquirement of speech was a slow process.
2nd. That from thirty to forty thousand years is the utmost limit that can be allowed to Man as a speaking animal.
3rd. That this period is a brief one in human history.
4th. That the chief distinctions of race were established long before Man acquired language, thus dating their division long before Man acquired language.

These modern and secular ideas clearly disagree widely both from the Biblical Chronology and Philology, in which Christians still firmly believe. For the Holy Bible teaches:—

1st. The unity of the Human race. This is positively asserted, or at least implied, God made one primal pair

—Adam and Eve (Gen. i. 27; ii. 22): all men being thus of one blood (Acts xvii. 26): since from the original pair the whole antediluvian human population sprang.

2nd. The capability of speech was innate and, like the speech organs, born with man as one of the handmaids of intellect. Man's creation and the origin of speech were thus coeval.

3rd. The original unity of human language is a necessary corollary of the unity of race.

4th. Since then language has been handed down from generation to generation by imitation and education.

5th. If any divergencies in language took place during the 2,257 years of the antediluvian epoch, the Bible has no record: doubtless because if they existed they were obliterated by the Flood.

6th. The original unity of speech was restored in the one remaining family of Noah when "the whole Earth was of one and the same speech" (Gen. xi. 1).

7th. The disruption of the secular world at Babel disturbed the original union of the community and the unity of language. Thus the purely human idea and purpose to centralize the race by establishing a great central edifice—tower—and city as the world's metropolis, obnoxious to God, was defeated by Supernal power and interposition, causing dialectual differences, which still continue, though more slowly, and with a similar result.

8th. Widely as languages now differ, the basis of the raw material, out of which they have sprung, still remains to enable Man to trace them out. The tendency of all human research, linguistic and ethnological, is to discover the elements of unity, amid the most varied external diversities.

9th. The original historic unity, linguistic—ethnological and otherwise, of the many different tribes and races of men will ultimately be shewn by care—and time, and thus one more testimony be added to the truth of the Scriptural narrative.

Biblical History

Many other Biblical educational subjects might be adduced to shew how replete with reliable—advanced—and deep information the Holy Book is; how great the trust we ought to place in its veracity; and how much we ought to value God's Word and its teaching and knowledge, even when what

it avers is for the time little intelligible to us, but yet all intended for early or late tuitional purposes, to enlighten humanity in most vital educational matters. All Bible students should ponder well each word and sentence donated by their "Father" —Creator and Councillor in Job xxxiii. 12; x. 4; 1 Sam. xvi. 7; Job xxii. 2.

The History and personal history or Biography of the Holy Scripture concerning good—bad—and indifferent nations—races—and individuals; but yet one and all educationally suggestive, as well as unique—because to be found nowhere else; are curt—comprehensive—searching—and for the most part the only reliable record of primeval times, peoples and persons who have contributed most to mould the ancient world and the present day. The History and Biography of early Bible times is remarkably corroborated by the secular records on the ancient tombs—temples—and monuments of Bible lands —Egypt, Assyria, &c.; heathendom thus strangely contributing to endorse Holy Scripture.

So in like manner illustrations might be given of Biblical law—geography—art and other prominent educational topics; all of them illustrated by allusions of an advanced, varied and often pioneer nature, long anticipative of the knowledge of the days when they were uttered. Nor can politics and statesmanship be anywhere found so pure—lofty—suggestive—far-reaching and educational as those which the Holy Scriptures advocate by practical illustration.

Taken as a whole, the peer both of ancient and modern Philosophy has justly styled the Holy Bible a "sublime Philosophy" from which more can be learnt than from any other volume. One of the greatest of modern infidels has confessed that had the Holy Bible been purely the production of Man, the invention would have been of greater import and led to more momentous results than the efforts of the greatest heroes. This conclusion of an Unbeliever stands in curious contrast with the opinion of those less erudite and less honest sceptics who sneer at Holy Writ and style the sacred volume "ancient letterpress." The value of the Philosophy and science of the Holy Bible can only be found out by impartial truth-seekers, not by partisans, nor by such as search with an avowedly unbiassed mind covering a lurking desire to discover error. Partial and biassed investigators often find only what they wish.

One Biblical science still remains for survey,, namely Medicine. With the exception of Theology, not one is so often alluded to in Holy Scripture as this. In one part, namely the Mosaic Code, it is didactically and practically taugh; and that as a full-fledged and pioneer science—that of preventive

Medicine or Hygiene. But as this subject is not only a wide but important one, and the main theme of the present book, it must be reserved for another chapter. The complete survey will shew that the Biblical Sanitary Science is not only important, but is a prominent aid to Christian faith.

The Hygieists of the Holy Scriptures

Of the many different writers of the Holy Bible, varying so widely in age, education and rank, almost everyone gives some hygienic hint or maxim, either of direct or indirect spiritual, moral, social or physiological application. Solomon—David—Job give many in the Old Testament; the Apostles and Paul in the New. Of the only two who were medically educated, Luke, the "beloved physician" (Colos. iv. 14) gives little that is specially hygienic for the body, though much that is of spiritual, moral and social importance. Whereas the other, Moses, though not professionally a medical man, is not only the chief sanitary writer in the Holy Scriptures, but was not only humanly taught at On, where he became "learned in all the wisdom of Egypt" (Acts vii. 22); and, more important still, was subsequently, and at a more mature and appreciative age, Divinely taught at Sinai (Levit.; Numb.; Deut.); and still more important, of all the Bible Hygieists he was not only a theoretical but also a practical sanitarian, by whom the effect of the newly divulged hygienic law of Sinai was tested on the new-born Hebrew nation. Moreover, Bible students ought specially to note that the so-called Mosaic Hygiene is merely an integral part of the so-called larger Mosaic Law, which, according to Moses' own testimony (Ex. xx. 1) is not Mosaic or human in any part, but wholly Divine; being given clothed not in the words or phrases of the human Moses, but as dictated by Jehovah Himself in the Holy of Holies (Ex. xxxiii. 11); and is thus superhuman, incontrovertible and of the very highest value, not only to the Hebrew people to whom it was originally revealed, and for their posterity, but also for all peoples and for every age. It was intended for the entire human race.

Of the 66 Biblical books the five earliest and oldest, those of the Pentateuch, give by far the most and most varied hygienic information: and this comprises valuable tuitional and practical matter on almost every sanitary subject, so as to form in the aggregate a complete system of sanitation, in which every one of its departments is represented: medical, surgical, obstetrical, gynecological, military, public, private, national, spiritual, moral, social and physical, the whole forming a multitude of Divine hygienic suggestions, hints and commands, given in the very words of Jehovah Himself, not in those of

Moses. Thus in the Pentateuch, we, as well as the Hebrews, find important sanitary rules and suggestions regarding:—

a Food: Ex. xvi. 13; Numb. xi. 3; xi. 33; Lev. vii. 24; vii. 26-27; xi. 1-47; Lev. xvii. 10-13; Levit. xvii. 15-16; Levit. xx. 25. These are both public and private.

b Water: Ex. xvii. 6; Numb. xx. 11. Public and private.

c Cleanliness: Ex. xix. 10; Numb. v. 2; xix. 11-22; Lev. iv. 11-12; Lev. iv. 21; Lev. iv. 11-12; vii. 19; vii. 4; viii. 17; viii. 32; iv. 28. Private and public.

d Rest: Ex. xxxiv. 21. Private and public.

e Disinfection, Holy Oil or Ointment: Ex. xxx. 23, 25. Holy Incense: Ex. xxx. 34-35. Public and private.

f Hygienics of Labour Distribution: Numb. iv. Private and public.

g Do. System and Order: Numb. vii.; xi. 16. Private and public.

h Do. Priestly matters: Lev. xxii.; iv. 33. Priests.

k Do. Progression of Tribes and Armies: Numb. i. 50-4. Levites.

l Do. Systematic Camping: Lev. ii. Public and private.

m Do. Disease, &c.

1 Childbirth (Lev. xii. 1-5). xiv. 1-57).
2 Leprosy (Lev. xiii. 1-59;
3 Issue (Lev. xv. 1-15).
4 Emissions (Lev. xv. 16-18).
5 Issue (female) (Lev. xv. 19-33).
} Private and public.

As a whole this forms the oldest hygienic system extant; as it was divulged at least 900 years before the era of the oldest of our noted physicians, Æsculapius. It is not a human but Divine compendium; because, though written as Christ averred, by Moses (John vii. 19), and so named by Divine Authority, it was really dictated to this chosen amanuensis and editor in the privacy and silence of the Holy of Holies (Ex. xxxiii. 11), and, with all humility, received and written in its sanctity, as the unseen Deity spake. The chief hygiene of the Holy Bible was therefore derived from the great Founder and Maker of all knowledge; at first hand; and in the very words of the All-Wisdom. The Mosaic Hygiene, like the Mosaic Law, of which it forms one, and that a most important section, was divulged to Moses and the Jews and Mankind. But can we suppose that it was made and codified there; or is only suitable for our race, and only applicable for Earth-life? Were not the

Mosaic Law in its entirety and the hygienic portion codified long anterior to Sinai and even Earth; in the very "beginning" of Creation, when the Mighty and far-seeing Creator made His countless plans; arranged His matter—forces—and laws for His forthcoming work—that of Creation; ere the first orb, or even the first living intelligence was elaborated by the Supreme formative skill. The Mosaic Hygiene we are about to study is thus not human but Divine. And is worthy of investigation not only because of the highest tuitional import, but because it is medically interesting and valuable. For, though supremely ancient, it is neither obsolete nor antiquated, but perfect—perennial and immortal, like its Author, Jehovah, the earliest and most August of hygiests and sanitary expositors.

CHAPTER II

BIBLICAL MEDICINE, EDUCATIONAL

"Search the deep things of God" (1 Cor. ii. 10; Psalm xcii. 5; Psalm cxix. 96).

While Jehovah has taught us much concerning Himself and His Works, He has also educated us deeply regarding ourselves, and human medical matters, a fact of deep import. All living things, animals and plants, from the highest to the lowest, have their own special "medicine"; that is various healthy or morbid conditions, and certain material or immaterial influences which affect these, simplest in simple forms and most complex in the most highly organized. In these pages we have to do with that of Man, the most elaborate creation on Earth, thus requiring the most complex medicine of all. To understand and appreciate it properly, and what the Holy Bible enunciates we must clearly know what a Human Being really is. For this information, and for many most important human affairs, we have to look to the Sacred Scriptures; and to these alone. Who could better educate us on these points than the Creator, who fashioned and sustains us?

The latest scientific definition of a Human Body is that of Verworn: viz., that it is an aggregation and community of cells, working together for the common weal under the administration of the nervous system. To this, the Holy Bible alone helps us to add that a human being is what he avers, but dominated by the soul. But the same volume tells us still more by informing us whence Man came; why; how; who is his Maker; and for what purpose he was Created. What, therefore, is the authoritative Divine or Biblical definition of Manhood? What does the Author of our being say about us? To say that human beings are women and men defines nothing. The subject is one on which there is much and widespread popular misconception and ignorance. How few take the trouble to think this matter over; and fewer still to think this simple yet vital question out. Although, What am I? ought to be deemed one of the most important of questions for every living soul to solve; as it leads to so many secondary queries of almost equal import.

As—for example, Where am I? What is my place in Creation? Why am I here? What is my future? These are more important problems and "burning questions" for each individual in our race than any other that art—science—philosophy—or politics can offer. Are we apes or angels; or, if neither, what are we? This vital question no doubt occurred to the learned among the ancients. But the wisest of moralists and philosophers, such as Budda—Brama—Confucius, and so forth, could give us no clue. Plato and Socrates dialogued and failed in their quest. We therefore turn to modern science and philosophy for an answer, and first to the Naturalists. These assign Man his place in the animal world by telling us that he is its copestone; the only animal that cooks his food; that walks erect; that speaks. But is that all that a human being is? Does it satisfy any mortal to be deemed a high-class beast? As they can go no further, we next turn to the Anthropologists and Ethnologists, but only to find they cannot help us more, and merely give individual opinions and contradictory evidence. And so in our desire we may cull the pages of the philosophic and scientific volumes of the hugest libraries of the world, but all in vain; until we come to one small and oft despised or forgotten book; Earth's sole immortal volume; God's guide for Man; the Holy Scriptures. In this we find that the question, what is a human being, was fully answered centuries ago, long before the Mosaic Law was bequeathed, and by the best of all authorities; and on the evidence of a Being who was present at his birth; nay, by the very Creator Himself; the only one who knows fully what Man is; knows all about him; and who alone can speak with authority and certainty, not from hearsay or theory, but from personal knowledge and fact; not from supposition, but with certainty.

What is a Human Being?

What therefore does this sole reliable authority, our Maker, and the only reliable volume, His Holy Bible, say what a human being is? Genesis tells us five important points, to be found in no secular book or Natural History: viz.—

1st. That man was a special creation. Having slowly evolved Earth during the long ages of the past as a special abode for the race He was about to create as its copestone; having furnished it with its special animal and vegetable garniture, and found all satisfactory or "very good" (Gen. xxxi.); He next proceeded to fashion Man, the most complex of all His creative developments, in this His last completed act.

2nd. That Man is a being whose rank on Earth was *first*; and in Creation only "a little lower than the Angels"

(Ps. viii. 5). This special honour accounts, and the Holy Bible is the first and only authority to explain why, for the long, wide, still unbridged and doubtless impassible gap which Naturalists admit still exists between Man and the higher Anthropoids. Man was a special and unique Creation, made for a special purpose.

3rd. That Man, like everything else that exists on Earth and in space, did not spring from or by some inherent and unexplainable force in matter, but had one and the same Maker: and that the God who Created the Starry Heavens was He who planned and fashioned and evolved this new conception, Man.

4th. That the real human being, the true ego in humanity, is not the corporeal but the spiritual entity; our earthly body being only the transient abode of this.

5th. That Man alone was originally made in the image of his Almighty Maker.

All that is proved, either directly or inferentially, by the Bible text (Gen. i. 2-3), which gives us several more minute and equally important details to be found nowhere else. When "God said let us make Man" He evidently addressed some of His higher Intelligences, presumably the Second and Third Persons in the Trinity. It may be that the design—construction and vivification of many or most of the other earthly creations were deputed by the "lord of life" (Rom. xiv. 9) to His sub-architects, the principalities and powers who "do His will" (Colos. i. 16; ii. 10). But Man's Creation was undertaken by the Triune Godhead only; and not by a deputy; high honour for this new development and fresh departure in Creation. With the minutiæ of the Creation of the first Man, the Bible does not very fully enlighten us. Nor does it say whether the process was slow or instantaneous. To design and evolve from inert clay so complex a being as Man, and then animate this by instilling life; and even to do this at once; appears more wonderful and miraculous to the Anatomist and Physiologist aware of the beauty of his microscopic structure, than to the non-medical mind. But to the Believer and Christian it seems no more marvellous to do this, and far less of an effort of an infinite Wisdom and Power like Jehovah, than it would have been to make a World, nay, a galaxy of doubtless very diverse orbs, such as bestuds the midnight sky. In faith and full belief we therefore trust the Bible narrative; not measuring Jehovah's ability by ours (2 Cor. x. 12; Ps. l. 21). Man's mortal part or body having been formed from the "dust," that is made of perishable matter, and his imperishable part implanted in this, the story thus continues, "and God breathed into his nostrils the breath of *life* and Man became a living soul" (Gen. ii. vii.).

Thus into the already fashioned but still inert twin forms of body and soul, mysteriously and closely incorporated and unified as an "embodied soul," two very different kinds or "breaths" of life were then infused to animate and start them into vital action; atmospheric air to initiate the corporeal or physiological vitality; and God's "Holy Spirit" (Ps. li. 11; Is. lxiii. 11; Luke xi. 13) to animate the soul and initiate Man's spiritual existence.

In His revealed Bible Jehovah thus tells us what no human being or book can enlighten us about; that Man was made originally in His own spiritual "image" or "likeness," and was thus endowed with a higher nature or soul, of Divine and Heavenly origin, nature and destiny. The Holy Bible would have practically wasted words to tell us that we were living *bodies*. That physiological and anatomical fact each individual can discover for himself. Jehovah therefore enlightens us only regarding that which we could never have found out; about that humanly invisible entity which we possess and indeed mainly are; an entity we can never see—feel—or isolate either in others or ourselves; and will never perceive until our spiritual eyes first open in Eternity, our real self—the Soul.

Jehovah thus created Man a double being, curiously blent and animated; a temporal, earthly, transient and physical mortal body; to enshrine—house—and act as the vitalized organ of the immortal spiritual soul; the former mundane, the latter with a heavenly origin and goal.

Again from the Holy Bible alone we can glean the story of one of the most important events in human history, the "Fall," an event of supreme hygienic import. Satan, the "Whisperer," induced the primal pair to disobey—rebel—and sin against their Maker. The result of this folly was that soul—mind—morals—social life and body, as well as their environment, and hence also their medicine and hygiene, were materially altered for the worse. The soul—morals—and social instincts were no longer pure, holy and sinless. Body and mind became subject to pain, disease and death. Man had to toil for food; and woman to suffer in other ways. Moreover they transmitted both the blemish of sin and its punishments to their offspring. In no department of Nature is the law of heredity—spiritual—moral—social—physiological and pathological better illustrated than by humanity.

But humanity, as it was and might now have been; happy, sinless, unstained Edenic man and woman; and their special—salubrious—pleasant and beautiful environment, as they came fresh from the hands of the Creator, is not our present theme. As Hygieists, we have only to deal with post-Edenic Man, sinful, fallen, debased, degenerate, prone to err, and liable to its many and sad morbid consequences on soul—mind—heart—and body.

The two beings of the former brief physiological epoch and their environment, and hence their hygiene, were all very different from those of the latter and present pathological era and their progeny, the humanly countless mankind of the present day. We have to study Man as he now is; and in his new, less favourable—pleasant—happy and safe present environment.

Having thus, in its opening pages, informed us what Man really is, the Divine Book throughout teaches us many medical facts of extreme importance and practical value, because authoritative and from Him alone who can supply information of this kind, our Creator. It speaks especially and frequently of those most important episodes in every individual career, viz., Life—Death—Health and Disease. It gives no learned explanations or definitions of them. But what it says is eminently suggestive and inferential, and a most important part of our education. Thus it especially impresses on us the following facts:—

a That Man is a compound being, and consists not of a physical body only but of a corporeal frame, mysteriously conjoined and blent with an intangible and humanly invisible "living soul" (Gen. ii. 7).

b That this soul is the real ego and immortal, as it quits and survives the destructible mortal body at death; and returns to the Divine Being who gave it and from whence it came (Eccles. xii. 7).

c That both the body and the soul have each a special and distinct life and health.

d That the life and health of the body, of which all take such care, from instinctive and interested motives are, like the body itself, gifts from God, to be carefully tended and accounted for; and not our own (1 Cor. vi. 19).

e That the health and life of the soul, which so many neglect, are also gifts, like the soul itself; endowments given to carefully guard, and be individually accounted for to God.

f It also informs us of the relative value of these two human possessions, the body and soul; and thus that of their life and health (Mat. xvi. 26).

g It also shews that Jehovah has not endowed us with a soul, intellect, social instincts, moral faculties, and physical bodies; and left us to guard, guide and develope these for ourselves; but does this largely for us; and, if we will, educates us deeply in medical matters, to aid His own supernal efforts and designs. These great gifts of life and health are, like ourselves, His, and in His care; but yet, as gifts largely in our own hands to cherish.

h The Holy Bible also informs us that every part of our human entity, body—mind—morals—social life—and soul is subject to disease in many forms, each of its own kind; many of them being specially named; and all alike acting and inter-acting on one another.

k The Holy Bible goes still further and tells us how to preserve the life and health of the body by warding off the multiform diseases so apt to undermine the former and undermine the other. And indicates the hygienic measures necessary to accomplish this, theoretically and practically. All of them are best met and controlled by the Divine methods, especially the preventive, to be subsequently entered into.

m It also informs us how to preserve the health, vigour and life of the invaluable immortal soul or ego, while on Earth, by corresponding spirito-hygienic or sanitary appliances.

n It also tells us how best to preserve the moral and social life and health of the individual and the race; two departments of Earth-education intimately associated both with our spiritual and our physical natures.

o The Holy Bible also informs us why it gives all this information; namely, to enable us individually and collectively to aid Jehovah in promoting the great object of our earthly probation and possible re-habilitation: results to be largely accomplished by God's hygienic measures, spiritual—moral—social—and corporeal, both preventive and curative. The more perfectly we keep and tend these departments of our health, the better we please and aid Him: and the more we promote His efforts for our good; and supplement Christ's sacrifice.

p This comprehensive hygienic educational information and scheme, formulated by Jehovah Himself and revealed in His Holy Bible, which informs us how to preserve, prevent disease of, or reclaim the health of the soul—morals—social life—and body, individually and collectively, of our composite nature, and as beings possessing several distinct yet closely intertwined entities, is a revelation of Jehovah's own masterly—beneficent—infallible and Divine sanitary methods: therefore invaluable; and a subject which it is both our interest and our duty to study as a distinct portion of the Sinaitic Code; especially as it inferentially inculcates and advances hygiene, the chief branch of medicine and a higher object that Disease cure; and does this in the very words of Jehovah Himself.

Biblical Physiology

Though found in a non-medical but theological book: and though written in the early dark ages, when neither Anatomy nor Physiology were studied. And though the Biblical exponents were chiefly non-medical minds; yet the Physiology of the Holy Bible is deep, important, pioneer and valuable, not only *per se*, but as a prelude to that study which has Physiology as its essential basis, namely Hygiene. All this because the Physiology of the Bible is Divine; its forces and laws having been made before Man came into being, and as part of the laws of Nature. The non-medical pens who wrote it did as they were impelled and instructed by a higher power. All they divulge is both simple—clear and meant for all humanity and all time. And modern minds may yet learn much from the physiological teaching of the Holy Scriptures; clearly given for our human, medical and general education. Here we can only point out some of the more remarkable.

The Human Body

This consists of many different organs; these again of many different tissues; these again of variously constructed fibres and cells; each of which lives a life in part independant of the rest of the body, and partly dependant on every other organ, system and tissue for support and sympathy. The life of the individual is therefore the sum of the lives of all the many and varied organs—tissues—fibres and cells. The mutual relation of these has been very appositely defined thus. The body is a "machine of the nature of an army; of which each cell is a soldier; an organ a brigade; the central nervous system headquarters and field telegraph; the alimentary and circulatory systems the commissariat. Losses are made good by recruits born in camp; and the life of the individual is a campaign conducted successfully for a number of years, but with certain defeat in the long run. Health consists in the combined efficacy of the individual soldier; and perfection of the machinery by which he is fed and brought into action at the proper time; disease, in abnormal states of the physiological units or perturbations of their co-ordinating and alimentative machinery." Contrasted with this secular illustration, how apposite—accurate—beautiful—and, for general purposes, how medically and educationally practical is the strictly physiological description of the diversity—relative importance—mutual relation—harmonious action and unity of these different organs and systems in health and disease, given by St. Paul, when he says that "the body is one and hath many members; not one member, but

many. God hath set these members, every one of them, as it hath pleased Him. The eye cannot say to the hand, I have no need of thee; nor again the head to the feet, I have no need of thee. They are not all alike, strong. Nay, much more, those members which we think are less honourable, on these we bestow more abundant honour. God hath tempered the body together that there should be no schism; but that the members should have the same care of one another; and whether one member suffer all the members suffer with it; and if one member be honoured all the members rejoice with it" (1 Cor. xii. 12). A nice adjustment of the physiological balance and harmonious action of the different systems, functions and organs, constitutes health. Their disturbance, on the other hand creates what we term disease. In either case, as the Holy Bible indicates, if one is affected all the rest are secondarily influenced, more or less for good or evil—for health or sickness. The important bearing of these fundamental physiological and pathological laws on medicine and hygiene will be especially apparent. A large and very important part of the treatment of disease consists in helping the natural tendency of deputy or vicarious organs in their efforts to aid their weak or ailing fellow organs until able to resume their normal duties. The tact which he displays in this is the best index of the skill of the physician.

The Holy Bible gives an equally perfect physiological description of old age in highly poetic and figurative language, thus "while the years draw nigh when thou shalt say I have no pleasure in them; while the sun or the light, or the moon, or the stars be not darkened, nor the clouds return after the rain: in the day when the keepers of the house shall tremble, and the strong men shall bow themselves, and the grinders cease because they are few, and those that look out of the windows be darkened, and the doors shall be shut in the streets, when the sound of the grinding is low, and he shall rise up at the voice of the bird, and all the daughters of music shall be brought low; also when they shall be afraid of that which is nigh, and fears shall be in the way, and the almond tree shall flourish, and the grasshopper shall be a burden, and desire shall fail, because Man goeth to his long home" (Eccles. xii. 1-5). This beautiful description of old age illustrates its troubles, infirmities, diminishing cheerfulness, querulousness, general gloom, insensibility to pleasure, dulled hearing, dim eyes, weak arms, tottering limbs and gait which dread the crowd and the hill, shrill, weak, whining unmusical voice, toothless gums, general timidity, easily broken sleep, hoary head, palled appetite, taste, and worn-out senses which nothing can stimulate, general sluggishness of every organ and function of the worn-out body fast falling to ruin; all are faithfully pourtrayed by the inspired pen.

Life, Health, Death, Disease

The Holy Bible introduces us to four of the greatest physiological conditions and most important episodes in human life; namely, Life—Death—Health—Disease, their mutual relations and interdependence. With the double view of aiding our knowledge of these four conditions, and of instructing us how to preserve health and life and thus ward off disease and death, a large amount of physiological, and especially medical, information of deep import and value is scattered through God's Holy Book: bringing us face to face with some of the commonest yet most inscrutable and intangible conditions and occurrences. Like some of the commonest things about us, such as gravity, light, heat, electricity, magnetism, chemism, motion; and also like some of Man's most prominent mental characteristics, such as love, hate, and so forth, the nature of life and death, health and disease, which play so prominent a part not only in the history of the human race, but in the private career of every individual, are states of body easy enough to comprehend but difficult to define in words. Nor does the Holy Bible help us much in this matter. It gives no scientific explanations of these vital points. These physiological puzzles, probably the first philosophic problems of the earliest times, and such as have engaged the attention of the thoughtful of all ages, will perhaps ever remain enveloped in mystery. They have no entity or material form to enable investigators to chemically, physically or microscopically examine or analyse them. We can no more see, taste and examine them than we can a pain, thought or emotion. So that in our mystified ignorance we generally get out of a difficulty by describing them negatively by telling what they are not, which is really no explanation at all. Every definition yet given, however, falls far short of the whole truth. For, practically speaking, during the whole course of our earthly career, disease and death are constantly ready to attack and overpower us; thereby making health and life exceedingly unstable. From the cradle to the grave the human frame is not only prone to assault from internal sources, but also everywhere surrounded externally by numerous and powerful morbific agencies ready to enter by a myriad different channels to fix on, disturb and, mayhap, destroy it. So that from first to last, from the cradle to the grave, life is really a perpetual fight against death; and health an endless struggle to avoid disease; the contest being carried on in most cases under the least favourable circumstances; including defective knowledge of our fabric and of the sources from whence danger thereto is most apt to come. From this point of view, health and life and their opposites are thus in perpetual strife with illiteracy. So that, as a rule, even

those who study the abstruse subject are practically near the end of their earthly career, and ready to die ere they have fully learnt how to live.

From the date of Man's fall and expulsion from Eden he has been brought into contact with two things of the utmost import; and which, therefore, it is both their interest and duty to cherish, namely, Life and Health; and with two other things equally their interest and duty to avoid as long as possible, namely Disease and Death. About the former two, and the great value of health and life, there can be neither doubt nor dispute. And that, altogether apart from the feeling of sacredness which attaches to humanity in the minds of all right-thinking people; and to the spiritual essence from whence these came, and in whom we live, move and have our being. Nothing is dearer to all than life. Nothing can compensate for its loss. Hence the strong and universal desire and instinct to preserve it. Next to this, health is unquestionably the greatest of earthly blessings; although many are more careless and prodigal of it than of anything else. Health is the greatest of earthly blessings; and its true value enshrined in the well-known proverb, "Health is better than wealth." Without this, riches—glory—honour — titles — rank — position — figure — beauty — grace —talent—accomplishments—success and all else are worthless. Nor can any one of these purchase a single moment's ease from pain, shorten sickness even by one brief hour, or prevent death by a single day. On the other hand, disease is in every way objectionable, and includes waste of individual and communal strength—money—time—comfort—happiness and often life. While for nations it usually includes depopulation (Lev. xviii. 25), decay, inactivity, inferiority and, perhaps, subjugation. Private history proves the former proposition; while public and Bible history do the second. Many an invalid would cheerfully, like Job (Job x. 18), resign every earthly possession for a lease of the rude health of the rustic. Many a one on their death-bed, like Hezekiah (2 Kings xx. 3; Job ii. 4) makes earnest, though perhaps vain, entreaty for a prolongation of that priceless boon called life; and perhaps promises as faithfully to subsequently make their care of both treasures one of their first and greatest, instead of, as previously, their least thought of and seldomest studied interests. Very different is the following more just and sensible estimate of life by one of the most estimable and philosophic of Christian physicians, Sir Thomas Browne, who says, "Men that look no further than their outsides think health an appurtenance unto life; and quarrel with their constitutions for being sick; but I that have examined the parts of Man, and know upon what tender filaments that fabric hangs, do wonder that we are not always so; and, considering the thousand doors

that lead to death, do thank my God that we can die but once." It is not surprising that the interest of thoughtful people on these subjects is intense. Good health is the working man's capital; and the wealthy man's boon. And in every condition of life there are few who have not learnt during some portion of their career how greatly the enjoyment not only of intellectual but of all other pursuits, is diminished by a weak constitution and bad health; and, on the contrary, enhanced by good health and a vigorous body.

On the other hand there can be no question of the tenacity with which all, even godly persons, cling to life; and of the abhorrence with which mankind shrink from disease and use their utmost efforts, altogether independent of duty, and animated mainly by a disinclination to face the ordeal, by using our utmost endeavours to shun death as long as God will permit. Bearing on this subject there are certain important facts perhaps not generally known or remembered at the present day. First of all, that most people die of disease. Those who die from pure and uncomplicated old age are a very small minority. The majority of mankind, even the very aged, succumb at last not from the general decay and wearing out of the body, but from some special ailment; certain diseases being more prevalent among the young, others among adults, and others among the old; parasitic diseases being more common among the former and degenerative ones among the latter. Another fact not generally known, but of great personal importance, is the amount of disease constantly present in our midst all over the habitable globe. This may be estimated by a few simple statistics. Thus estimating the total number of inhabitants on the earth as one thousand millions, no fewer than 33,333,333 of these or about one-thirtieth die every year: that is 91,824 every day; or 7,780 every hour; or 60 per minute; or one every second of time and tick of the clock. Moreover, this alone does not shew the total amount of sickness that prevails; for it is only some of the ailing that die. But it is estimated that for every death that occurs, there are on an average from 20 to 25 other cases of sickness prevailing at the same time. By this estimate the total amount of disease constantly occurring on the Earth amounts to not far short of 25 new cases every second of time; or 1,500 every minute; 90,000 every hour; or 2,160,000 every day; or over 788 millions of new cases of sickness every year. Equally instructive, interesting and apposite is an estimate by Farr of the march through life of a million of new-born children, shewing what becomes of them, how long they live, and how comparatively few survive even to see adult age.

From this table it will be seen that 23 per cent, or nearly $\frac{1}{4}$ die before they reach three years of age: 15 per cent., or nearly

one-seventh, during their first year: 50 per cent., or one-half, die before they reach their seventh year of age: while only 9 per cent., or 1 in 11, reach 80 years of age: and only the very small fraction of ·0223 per cent., or 1 in 4,484 see their centennial year.

TABLE I

Career of one million of new-born children.

	Number Dead.	Number Living.
At birth - -		1,000,000
In 1st year - -	150,000	850,000
End of 2nd year -	203,000	797,000
Up to 3rd year -	231,000	769,000
Up to 13th year -	235,000	765,000
Up to 45th year -	235,500	764,500
Beginning 60th year	630,000	370,000
End 80th year -	910,000	90,000
End 85th year -	962,000	38,000
End 95th year -	997,900	2,100
Beginning 100th year	999,777	223
Beginning 108th year	999,999	1

These facts shew how closely medicine is intertwined with the Bible narrative. Not only does the Pentateuch give the story of the introduction of human life and health, but also that of disease and death. It also informs us of the reason for the latter; man's own fault. We must recognise the Divine source of all four, however; define life, health, disease and death as we may. And we do not ascribe their origin and phenomena to any self-originated and inherent power in matter. Their source is Divine.

What is life? As we say that light is the absence of darkness and cold the withdrawal of heat; so the meaning oftenest given of life is that it is the absence of death: and of health that it is the non-existence of sickness, or an exemption from disease, strictly so called; for with most people health varies and often differs in amount at different periods of life and in different circumstances. As we do not know what part of the human frame is the abode of the soul, and which is its last or only citadel before it severs its connexion with the body; so we do not yet know of what the subtle something called life consists, or its exact seat, whether it is a generally distributed principle, or localized in some special organ or spot. A more philosophical definition of life is, that it is an intangible and mysterious agency which has the power of taking particles of inert matter and converting them into healthy living animal or vegetable form: this mysterious power being possessed not only by the animal or

plant as a whole; but also by every organ—tissue—fibre, and cell of these: the plant or animal being thus a compound entity which comprises the sum total of a multitude of minor lives. Many more apt Biblical illustrations of physiological truths might be given. A few others will shew how deep the medical philosophy of the Holy Scripture. Thus how truly the text "The life of the flesh is in the blood" (Lev. xvii. 11); and also "The blood is the life of the body" (Gen. ix. 4; Deut. xii. 23) shew the life-carrying virtues of that vital stream; the only fluid in the body which can be so spoken of, and with regard to the life of which physiologists have ceased to argue. Do they not forestal or at least foreshadow and endorse Harvey's modern discovery of the circulation which carries that all-important element to every part of our frame. The Holy Bible gives no Divine definition of Life. But, as with Health, its conditions and aids, especially for the higher or spiritual life, are frequently given (Deut. xx. 19; Prov. xiii. 14; xiv. 27; xiv. 30; xv. 4; xxii. 4, &c.).

What is Death? Modern research has pointed out some very interesting and comforting facts regarding that solemn and final battle of life in which Man's inherent vitality is at last overcome by the most potent and persistent of all its foes; who is to individuals and the race the last enemy to be destroyed (1 Cor. xv. 54); that mysterious separation of the occult and temporarily associated soul and body, when the latter returns to Mother Earth and the former leaves and goes elsewhere (Eccles xii. 7). Although there are some few, wearied of the struggles, pains, sins, troubles, disappointments, unrest and unsatisfied longings of life, crave for the peace and sleep of Death (Ps. xiii. 3); for that Death which cometh not (Job iii. 2), the great majority of people, even the truly God-fearing and God-loving, have more or less dread, (Heb. ii. 14), of that last fight with disease and death, and of the agonies (Ps. xviii. 14; cxvi. 3), pains (Acts ii. 4), terrors (Ex. x. 19; Ps. lv. 4), and the bitterness (1 Sam. v. 32), of which no participant has ever yet been permitted or able to give an account. Equally disquieting to most people is the approach to the grave, the antechamber to that mysterious journey, and bourne from whence no traveller returns (2 Sam. xii. 23), to tell what lies beyond the vail; and with regard to which the Biblical allusions, such as "the chambers of Death" (Prov. vii. 2); the "land of darkness and of the shadow of death" (Job x. 21); the "gates of Death" (Ps. cvii. 18); the "doors of the shadow of death" (Job xxxviii. 17), are not half so depressing and awe-inspiring as our own innate fears. Most persons fear death more or less for its supposed agony and struggle; and dread the mysterious beyond. To counteract this, the most consoling fact is, that in most cases

of disease attended by great pain it is usually pretty evident that Death generally begins in the afflicted spot or organ, so that the agony lulls or disappears more or less before Death. The final struggle is thereby robbed of one of its great terrors—the Death agony. Again, in those frequent cases where laborious respiration, often most distressing to onlookers, is the most prominent phenomenon; the torture is apparent only, not real. Because, long before the breath departs, the heavy but incomplete breathing retains the carbonic acid that ought to be excreted by the lungs, in the blood, which carries it on to more or less completely narcotise—anæsthetize or deaden every organ —part—tissue—fibre and cell in the body, and lulls its every sense and feeling. Death is thus in most, and perhaps in all, cases, even when the mind is clear and the intellect bright, deprived by our loving God and His benignant law of nature from causing the physical torture and mental distress usually regarded as inseparable from this the last great physiological act of the human frame, that of dying. And, since the destruction and decay of the dead body go on in an inert mass, from which sense and feeling have departed with life and the soul, and cause no pain or other form of uneasiness to the individual spirit that no longer inhabits it, but has gone elsewhere; nature has kindly ordained that though we *must* die, Death and the grave alike, both so much dreaded, are half robbed of their terrors. And thus when these ultimately become the lot of all, how truly can we exclaim in a physiological sense, as well as in a spiritual and godly one, thanks to Christ's atonement, "Oh Death where is thy sting"; "Oh grave where is thy victory" (1 Cor. xv. 55). This philosophic conclusion regarding the process of dying is interesting, important and consoling. But still it does not reveal what Death really is. Here, again, the Holy Bible comes to our aid, and in one sentence inferentially tells us three most vital facts, namely, that we have each a soul; that this is immortal; and that there is a future life. Without this revelation, like Plato and Socrates, humanity, with its science and philosophy, could never have found these facts out. Paul gives one equally fine and truthful, though metaphorical description of the circumstances which accompany and characterize this dread function, Death; the frail and easily severed connexion between the human body and life; and between the body and the soul; the final cessation of every vital function; the consequent separation of soul and body; and the last and greatest physiological act which constitutes dissolution, thereby ending the present life and permitting the body to go to its long home (Eccles xii. 5); the narrow house it occupies longest; and the soul to its future everlasting abode (Eccles xii. 5). "Man goeth to his long home, and the mourners go about the streets; or even the silver

cord be loosed, or the golden bowl be broken; or the pitcher be broken at the fountain; or the wheel broken at the cistern. Then shall the dust return to the earth as it was; and the spirit shall return to the God who gave it" (Eccles. xii. 6-7). The Holy Bible tells us something more than Man could ever have found out; viz., who controls Death, permits—sends—or stays its hand, and gives many practical illustrations of these.

When life leaves the organism, thus causing a complete stoppage of every function in the frame, rendering this no longer a fit abode for the Soul, which then quits its earthly tabernacle, thus permitting this to return to its original chemical elements by decomposition and disintegration of its component parts, the result is called Death. But the physiology of the Holy Bible goes far deeper than illustrating the death of the body *en bloc*. Carpenter was the first to shew that just as the human frame has its heaven-allotted span or length of life (Ps. xc. 10; civ. 29-30); so every one of its many fibres and cells is formed for a far more brief and often very short existence, at the end of which it dies, and is directly or indirectly cast off and excreted out of the body. And thus it is only by a constant new creation and reconstruction of the microscopic atoms that this perpetual waste of individual tissues is obviated, and the body retains its bulk—health—and existence. Chossat has even determined the extent of this, and ascertained that the daily waste in various healthy animals is, on an average, one twenty-fourth of their weight. Johnston avers that when fasting, and the body of course living on itself, as it also does largely in disease, it loses from one-twelfth to one-fourteenth of its weight in twenty-four hours. Schmidt reckons the rate of waste in the human being at one twenty-third of its weight. And, on an average, it may be calculated that the waste proceeds so rapidly that the whole body is renewed on an average of thirty days. These facts, interesting in themselves, bring into especial prominence some of the oftenest quoted, though figurative, expressions in Holy Writ. Thus "I die daily" (1 Corin. xv. 31) is shewn to be a strictly accurate physiological, as well as spiritual, truth; since all of us, like the Apostle himself, begin to die by molecules the moment we begin to live; and of these molecules many millions must be destroyed hourly in the various physiological processes constantly going on, such as motion, secretion, thought, &c. Life from this standpoint may thus be said to consist of a series of partial deaths. While the body, as a whole, only lives on condition of incessant elementary disintegration, transformation and elimination of old or effete organic material, which is replaced by new. The human organism is continually dying by molecules. Nor could we live on unless these died. Nor is it surprising, in view of these facts, that the

conditions we call health and life are so very unstable and precarious; seeing that, as a whole, they depend on the integrity of an infinite number of minute entities or parts; and on the equilibrium these must hold to keep a fair balance between organic good and evil. Again that "in the midst of life we are in death"; and that "death reigns in us" (Rom. v. 14; v. 17) are equally true physiologically as well as spiritually is apparent, since it is only by constant renewal of tissue that we are kept alive. Thus it is, both literally and figuratively, true that from birth to death mortality is "swallowed up of life" (2 Cor. v. 4); and "death swallowed up in victory" (Is. xxv. 8) by the inherent recreative power of individual tissues—fibres and cells.

Health. The human body being regarded as a highly vitalized machine, the most complex of the many organisms of which our earthly creation consists; the simplest scientific definition of health is, that it consists in the perfect functional and structural condition and thorough co-operation of its many different, yet intimately correlated, parts and organs. The healthy body feels comfortable, the mind is serene and existence is pleasant. Perfect health such as this, however, is comparatively rare among men. The number of the indifferently healthy, the ailing, and the really sick, far surpasses the number of those in the enjoyment of thorough strength and fully equal to their ordinary avocation. From a social point of view, health has been very appositely defined as that state in which the body is not consciously present; that condition in which it is a joy to see, think, feel and to be; that state in which work is easy and duty not over great a trial; that state in which the individual goes forward along the journey of life getting and giving joy. When the few chemical elements which form the body, seventeen in number, are arranged in a certain manner, so as to form living cells—fibres—tissues and organs: and these perform certain actions and functions well, the person is said to be healthy and to enjoy health. The Holy Bible gives no authoritative definition of Health, either bodily, spiritual, moral, mental or social: but only alludes to their aids (Acts xxvii. 34) or opponents; and especially emphasizes indirectly the higher conditions of health and their helps (3 John ii.; Prov. xii. 18; xiii. 17).

Disease practically consists in some deviation from health, arising either in the body itself or coming from without. It has been compared to a body storm affecting either some member, tissue or part, if not the entire frame: health being to life what the sun is to vegetation. Without co-operation both become torpid. Again, if the seventeen chemical elements of the body become badly and abnormally arranged in the different organs

—tissues—cells and fibres of the body; or if the functions of the latter are imperfectly performed, they are said to be unhealthy—ailing—sick or diseased. The Holy Bible gives no definition of disease; and yet it speaks often about it in its many different forms. It is well for mankind that is so; and we cannot be too grateful that Jehovah has not left us in complete doubt or ambiguity regarding disease, but has given us so many evidences of his personality, creations, the forces and laws of Nature, and their interdependence; because they form some of the first and most important facts incumbent on Man to know, with a view to promote both his temporal and his eternal welfare. Thus the Holy Bible informs us what no other book or authority can about disease and health. Thus it tells us that God not only made us and gave us these gifts, health and life, and manifold others, but that He still holds us in the "hollow of His hand" (Dan. v. 23). Life—health and our entire entity, and their opposites, disease and death, were not only given or permitted by Him, but are still under His sway. So that for many reasons, medical and otherwise, it is wise for Man to study both the Being who so reveals Himself and His Biblical bequest, in which He does this so prominently. Because the latter informs us that the Author, Owner, Sustainer and Controller of all things still rules us and the entities, forces and laws that control our life—death—health and Disease: and also points out the very important fact, that if left to our own free will we not only lose these beneficent boons and court and invite evil results, but, by imprudence and folly, practically make our own diseases.

The Holy Bible is also the only Book that can give another most important fact; namely the Story of the introduction of human sin and sorrow and the early history of Disease, and its first introduction among humankind; thus giving us the first chapter in the History of Medicine; the science and art which aims at the cure—amelioration—or extinction of the ailments so introduced on Earth, as well as the Hygiene which studies their prevention.

Biblical Medical History

The Holy Bible after informing us incidentally that Man was specially created as the copestone of the earthly cosmos; being essentially an embodied Spirit; and consists of an immaterial fashioned in the "image" of his Maker; tells us that he is soul joined in a mysterious mode to a very elaborate material body or highly vitalized machine, in—by—and through which the former works—lives—moves and has its being. The former or tenant is the real individual or ego; and the latter the

temporary habitation and medium in and by which the person performs his allotted part during his earth-life. From the earliest chapters of the Bible alone we learn what we never could have discovered otherwise, namely that the genetic pair had the option of a far happier, idyllic life and future than now befall their descendants; and also how the gift was lost. In Eden they were perfectly holy, happy, and healthy. Disease, Death, pain, parting, sorrow, were then, like sin, unknown. Adam and Eve lived in close communion, intimate fellowship and pleasing converse with their Maker, Preserver and guide, who was their God and unseen yet true friend and Instructor. During this earlier Edenic existence the Physiological—Hygienic—health preserving and disease preventing forces of human nature alone had sway: while the pathological or morbific, prevalent now among man and prevalent then among the lower animals, had no power, being divinely kept in abeyance; as they doubtless will in the life of the future. Man was then free from pain, disease and death of body, as well as from spiritual, moral, mental and social sin—disease and death. They lived a life of uninterrupted and unalloyed ease and peace of body and soul; content with each other, and in fullest accord with their Almighty Friend. We are told that the soul was originally sinless, though amenable to temptation, and endowed with immortality: while we may also infer that the body in Eden was exempt from disease; perhaps free from that gradual decay of tissue and impairment of function that characterize ageing; and also either physically—as the soul was spiritually immortal, or so gifted that the latter was capable at the end of its earthly career, and by the Divine fiat, or of its own accord after fulfilling its worldly mission, of throwing the body off, as it might an old garment, and making, like Enoch and Elijah, a painless transition from Earth to Heaven and the future state, without undergoing the distressing ordeals of disease and death. That God originally meant man to have an easy and painless death is a more likely supposition derived from Bible story, where it affirms indirectly that man was not created to live an earthly, at least a body life, for ever (Gen, iii. 22); and that it was partly lest he, after having eaten of the fruit of the tree of the knowledge of good and evil, might supplement this sin of disobedience by a further atrocity by eating of the other forbidden fruit, that of the "tree of life," was removed from Paradise.

The Bible history, and that alone, tells us of man's brief career in Eden, and of the early deprivation of this great but evidently unappreciated boon, uninterrupted health, and the end of the happy purely physiological era, and beginning of the less joyous pathological period in which we now live, during which so many and grievous evils have been rampant, one and all re-

sulting from sin. By the Fall all was changed. Sin, disease and death were now permitted to work their will on humankind and sadly mar their ex-parasidaic life. The Holy Bible in thus relating the history of the partial removal of the Divine countenance and support from man; and the combined spiritual, moral, social and physiological degradation that had befallen not only Adam and Eve, but also their unhappy and unfortunate posterity; also informs us that these evils resulted from the same cause, and were the punishments inflicted by the irate Jehovah for disobedience to the single and simple command which he had enforced, the counterpart of the eighth commandment of the subsequent Mosaic Code; and that they were simultaneously introduced into the history of man. It further points out the close analogy that exists between the origin, cause, cure and prevention of the spiritual and physical maladies to which mankind then became and still remain liable. With the fall, the human soul lost its sin-repelling and the body its disease thwarting power. So that while the one became the subject of inherited and indwelling sin and the other of hereditary disposition to disease and death, the soul on the one hand became prone to individual depravity and the body to physical ailment as well as the dissolution that often results therefrom. The Edenic rule of undeviating health thus became obsolete; while new laws, those of disease and pathology came into force. Unfortunately for some mysterious though doubtless wise reason our progenitors did not bear the sole burden of their sins; and were not the only sufferers by this mishap; as their offspring inherited the curse and its sad results; so that all mankind, except certain privileged ones, like Enoch and Elijah who were honoured for special godliness by being translated; and certain people like the Israelites who, because specially favoured by God, were made partially and temporarily exempt from disease and death except when they sinned (Deut. viii. 2-6), became not only subject to pain, sickness and final physical dissolution, but also prone to certain well-known and too often seductive agencies apt both to mar health and curtail life. The question, why the Creator, whose chief characteristic is love (1 John iv. 8-16) should have permitted sickness and death to enter the world and mar human happiness, is one beyond the scope of our present subject as is also its correlative why He permitted sin to besoil the human soul. Here we have only to do with Man and the Earth as we find them: the former a comparatively short-lived being, very prone to disease; and the latter a tragic theatre filled with human beings among whom Death's sickle is everywhere constantly at work. Thus it happens that the Bible story subsequent to that of the Garden of Eden and extending over a period of 7,312 years, as well as profane history reaching onwards

to the present day, contain a very different record. Since then sin has been more or less rampant, with all its consequences; as well as two of its more prominent punishments, Disease and Death. Much of that history is taken up with a narrative of the effects of these on persons, nations and the race. Consequently, interspersed in the test, sometimes incidentally, often designedly and suggestively, the Bible contains much medical matter of the deepest interest to both sound and suffering humanity.

Who Controls Disease and Death

But for the teaching of the Holy Scriptures, Man could never have discovered this most important fact, that the God who created him and ordained that we should pass through cycles of life—health—disease and death, keeps these events and phenomena largely under his own control; and explains why He does so. This He does as part of His general care of the being He has created. Love is God's greatest attribute (1 John iv. 8); and far excels ours (John xv. 13-16; Rom. viii. 38) and is everlasting (Jer. xxxi. 3); unchanging Jas. i. 7); and extends even to the careless and the sinful (John iv. 10-19; Rom. v.) He calls Man His offspring and children (Gal. iii. 26); sons and daughters (1 Cor. vi. 8). He calls Himself our Father (Mat. v. 48). His care is such that he is with us always—in every plan and place (Luke xii. 22-32; Ps. xxiii.; 1 Pet. v. 7; Mat. xxviii. 20). We cannot exist without Him; for in Him we live—move—and have our being (Acts xvii. 28); every hair of our head is numbered (Luke xii. 7); every event of our life noted (Mat. x. 30). If we ask Him, He will dwell with us in our home and heart (John xiv. 23). If we trust Him, our confidence will be neither betrayed nor unrewarded. Nor need we be over-anxious about food, raiment or worldly affairs (Luke xii. 23-28), even about life and health. And all this, although Man is so insignificant, degraded and rebellious (Rom. iii. 23). In all this He shews no favouritism, makes no exceptions. While to all He makes offers as large and liberal as to Solomon when He bestowed not only an understanding heart but also riches, honours and long life (1 Kings iii. 9). These facts God proves in His Holy Bible. Thus Uzziah propered as long as He sought the Lord (2 Chron. xxvi. 25). Zachariah was slain when he forsook Him (2 Chr. xxiv. 21). Manasseh, by humbling himself in captivity was restored to divine favour (2 Chr. xxxiii. 13). The lives of the Patriarchs and other Bible notables of Old and New Testament times tell the same tale. It is the same with National as with individual prosperity. God's care is frequently shewn throughout the lengthy story of the Children of Israel (2 Chr. xxix. 9).

But the Holy Bible goes still further and teaches us God's special influence over health—life—disease and death. Thus our life is in His hands (Gen. ii. 7; Deut. xxx. 15; Jer. xxi. 8; Job xii. 33-34; xxxvi. 6; Ps. xvi. 11; xxi. 4; xxvii. 1; xxxvi. 9; xlii. 8; xci. 6; Jonah iv. 3; Mat. vi. 25; Acts xvii. 25). He sets life before us (Deut. xxx. 15). The breath of the Almighty hath given me life (Job xxxiii. 4). God is the fountain of life (Ps. xxxvi. 9). He can satisfy us with long life (Ps. xci. 16). The God who instilled health and life either sends or permits the pathological forces and laws that cause disease and death. God's laws are "life to those who find them and health to all their flesh (Prov. iv. 21-22). God's people have a distinct promise of health and long life by obeying His moral, social, spiritual and physiological laws (Ex. xv. 26; Is. lxviii. 22; Prov. iii. 1; iv. 22; iii. 8; Deut. iv. 40; v. 33; vi. 6; xiii. 28; Lev. xxvi. 25). From the opposite course of contempt or disobedience, comes disease till our flesh and body are consumed (Prov. v. 7-11; Deut. viii. 2-18). Disease ensues by neglecting God's commands (Lev. xxvi. 16-25); and many curses threatened, including disease and death (Deut. xxviii. 15-29; xxxi. 17). God can prevent disease (Ex. xxiii. 25; Deut. vii. 15). So He can cause it (Ex. xv. 26; Deut. xxviii. 60). And also heal it (Ps. vi. 2; Deut. xxxii. 29; Ps. xxx. 2; cvii. 20; Jer. xvii. 14; Ps. ciii. 3; Luke ix. 1; Acts xix. 12). God kills and makes alive, wounds and heals (Deut. xxxii. 39). He strengthens and heals the sick (Ezek. xxxiv. 16; Ps. cvii. 20). Thus He threatened to exterminate the Hebrews by Pestilence for rebelliously refusing to enter the promised land (Numb. xiv. 12). While foretelling Israelitish disaffection God threatened many evils and troubles, including sickness (Deut. xiii. 17). In the Prophets, especially Jeremiah, punishment by sickness and pestilence are frequently menaced (Is. xiv. 12; xxiv. 6; xxvii. 8). As with the Hebrews, God sets life or death before us (Deut. xxx. 15). To Him belong the issues from Death (Ps. lxviii. 20; ix. 13; xxxvi. 9; ciii. 3). Physical good and evil, health and sickness, may be all God sent (Job ii. 10; v. 17; xxi. 27). God not only gives health and life (Acts xvii. 25), but also takes them away (Ps. civ. 29).

God supervises the health and the diseases of those who follow Him; as He also does other worldly matters. Ancient Hebrew history is a record of alternate prosperity and adversity, bodily and spiritual: of obedience, happiness and health, varied by disobedience, sickness and death. For lusting after flesh, many died of plague, probably from surfeit (Numb. xi. 33). So did 14,700 Hebrews for murmuring against Moses and Aaron (Numb. xvi. 46); and 2,400 others for idolatry and whoredom with the Moabites (Numb. xxv. 8). Korah, Dathan, Abiram

and 250 men were engulphed for rebellion (Numb. xvi. 35). Emerods afflicted the Philistines for taking the Ark (1 Sam. v. 11). The men of Bethshemesh, a priests town, were smitten for irreverently looking into the Ark (1 Sam. vi. 19). Many were slain of pestilence by David's numbering against God's express command (2 Sam. xxiv. 16). The angel of Death slew Sennacherib and 185,000 men in one night (2 Kings xix. 35). Many Hebrews were slain by venemous "fiery" serpents, otherwise innocuous though abundant, because the Hebrews murmured for bread and water (Numb. xxi. 6). For lack of faith in God and repeated persistent rebellion, all the Hebrews who originally left Egypt were consumed, that is, died in the wilderness without even seeing the promised land (Numb. xxxii. 13; xx. 12).

The Holy Bible teaches us similarly regarding individuals. Miriam was stricken with leprosy for murmuring and speaking against her brother Moses (Numb. xii. 11). So was Gehazi for cupidity (2 Kings v. 27). And Azariah for sacreligiously burning incense in the temple (2 Kings xv. 5; 2 Chron. xxvi. 19). Jeroboam's hand was withered for Idolatry (1 Kings xiii. 5). Jehoram was smitten with an incurable disease for forsaking God (2 Chron. xx. 19). Elymas, the sorcerer, was struck blind for perverting the ways of the Lord (Acts xiii. 11).

Again the more severe of these two punishments, Death, is illustrated by the case of Herod who was eaten of worms for not giving God the glory (Acts xii. 23): by Ananias and Sapphira who died suddenly for lying (Acts v. 5-10): by Judas, who burst asunder after betraying Jesus (Acts i. 18): by Ahaziah, who died for sending to enquire of Baal-zebub the God of Ekron about his sickness (2 Kings i. 17): and by Jeroboam, who was struck by God and died for making and worshipping golden calves, casting out the Priests, and other idolatrous practises (2 Chron. xiii. 20).

In most of these instances from Old and New Testament history, God was sooner or later recognised as the sender of affliction, while His clemency and power were also made manifest by staying or checking the infliction on the intercession of the tried individual or others. The New Testament is especially full of miraculous cases, either by Christ, or His disciples: for example of leprosy (Mark i. 40); Palsy (Mark ii. 11); withered hand (Mark iii. 5); issue of blood (Mark v. 30); deafness and dumbness (Mark xix. 35; Luke i. 64); blindness (Mark viii. 26; x. 52); lameness (Acts iii. 8); unclean spirits (Mark vii. 30; v. 13;) epilepsy (Mark ix. 26); fever (Luke iv. 39); diver's diseases (Luke iv. 40); the impotent—halt—and withered (John v. 1). According to Ader who wrote in 1621, these and other diseases healed by our Lord were all incurable then by medicine.

The Bible also gives instances of resuscitation from Death. Thus by Christ, when he raised the daughter of Jairus (Mark v. 41); the widow's son of Nain (Luke vii. 15); and Lazarus (John xi. 44); and by the Apostle Peter who raised Dorcas (Acts ix. 40).

Special and open miraculous interpositions of Providence in the physical, social and the religious worlds do not appear to form part of the divine programme in modern as in ancient times. As with our personal discipline at different periods of our life, so the moral, spiritual and perhaps the physical management and education of mankind at large, by the Supreme, doubtless varies at different epochs according to the requirements of the race. Still there can be little doubt that the Deity manages earthly matters, though not perhaps in exactly the same manner as He did in Bible days, especially those relating to mind, morals and health, all three usually more amenable to control than such as are purely or chiefly material, and surely capable of being swayed by God when this is not unfrequently and easily accomplished by Man. And there can be as little doubt that both national and individual life are still as in Bible times, in God's gracious keeping. True, the infliction of disease by the Supreme, and its cure are never openly expressed in modern times; but doubtless they sometimes, perhaps frequently occur in a silent, but no less certain manner. Life in every place—period—position and age is often marked by striking evidences of the inscrutable will of the Almighty.

And doubtless now, as then, although God does not afflict willingly (Lam. iii. 33), the dire troubles, disease and death may still be sent for various reasons; either in anger (Job xxi. 17), or in punishment (Prov. iii. 11-12), or to tempt and try us (Job ii. 6), or to recall us to our heavenly allegiance (Ps. cxix. 7). Where could we get such vital knowledge regarding the Divine relation to health—life—disease and death save from the Holy Bible.

But there is still another frequent controller of health, life, disease and death, namely, ourselves. The Holy Bible teaches that our Maker, who gifted us with life and health, has left these as well as the avoidance of disease and death largely in our own hands. Health and life are gifts to be put to usury and cherished. Many popular errors are afloat, regarding the manner of their loss and as to the advent of disease and death. Evil spirits, Satan, and oftener perhaps Jehovah Himself are often and largely blamed; when some other individuality is the only guilty one; namely the individual. Thus if an individual over-eats—over-drinks—catches cold—maims himself or wilfully breaks any of the known laws of health; is it just to blame God for our imprudence and its results? Or can we

blame Him if some careless or ignorant fellow mortal gives us some infectious or contagious disease; or if our municipal authorities, or government, cause disease by negligent sanitary legislation? It is to lead us individually and communally to keep health and avoid disease that God has taken the trouble to instruct us so minutely and deeply in Hygiene.

In addition to these, the Holy Bible gives many other very apposite physiological allusions: many of a pioneer nature. Thus it shews how important the heart is in the human economy; how it affects the whole Man; and how true it is socially, morally, spiritually and physiologically that "out of the heart are the issues of life" (Prov. xiv. 23), and that "a sound heart is the life of the flesh" (Prov. xiv. 30). This wonderful little hollow muscle or bundle of flesh, which rarely weighs over eleven ounces; which never wears out; never stops for repairs; seldom gets out of order; rights itself as it runs; and cannot be thoroughly examined till it stops for ever; projects about six ounces of blood through the body every time it beats, and beats without a pause thirty million times in a year, or more than two thousand and five hundred million times in a life of three score and ten years: and thereby exerts at each stroke a mechanical force of thirteen pounds every stroke, a force sufficient to lift one hundred and twenty tons, one foot, in twenty-four hours. If this little vital machine were to stop its rhythmic movements even for a few moments, every one of these physiological phenomena, mental and physical, would soon stop and the body cease to live by the deprivation of the usual supply of tissue food and air, which the blood carries thither. The important and central place of the heart in Man's economy is also symbolically shewn when the Scriptures speak of the "heart of the sea" (Exod. xv. 8); the heart of the earth (Mat. xii. 40); and that of Egypt (Ps. xix. 1). That "a merry heart doeth good like a medicine" (Prov. xvii. 22; xxvii. 19) and often more speedily and abundantly, is a truism within the experience of all. And though physiologists believe that the mental, moral and spiritual Man does not reside in or spring from his heart, but from his central nervous system, especially the brain: still, that these are controlled by the former, while this again has a reciprocal check on these is proved by the frequent Biblical allusions to the heart from which all the good and evil feelings—affections—passions and faculties in human nature are said to spring; as if the heart were the Man. These have a weighty hygienic bearing, not on physical sanitation but on the higher hygiene of the soul morals and social life. Thus to this organ, the heart, are figuratively credited, and with much physiological and psychical truth: sorrow (Lev. xxvi. 16); courage (Numb. xxxii. 7-9); astonishment (Deut.

xxviii. 28); gladness (Deut. xxviii. 47); fear (Deut. xxviii. 65; Josh. xiv. 8); perception (Deut. xxix. 4); despite (Jude v. 15); knowledge (I Kings iii. 9); deceit (1 Chron. xii. 33); wisdom (Job ix. 4); pride (Ps. ci. 5); subtlety (Prov. vii. 10); obstinacy (Prov. xii. 8); heaviness (Prov. xii. 25); hope (Prov. xiii. 12); judgment (Prov. xv. 9); haughtiness (Prov. xviii. 12); purity (Prov. xxii. 11); folly (Prov. xxii. 15); evil (Eccles. ix. 3); joy (Is. xxx. 29); rashness (Is. xxxii. 4); falsehood (Is. lix. 13); rebellion (Jer. v. 23); sadness (Ezek. xiii. 22); meekness (Mat. xi. 29); generosity (Mat. xii. 34); guilelessness (Acts ii. 46); impenitence (Rom. ii. 5); belief (Rom. x. 10); anguish (2 Corinth. ii. 4); singleness (Col. iii. 22); truth (Heb. x. 22); covetousness (Ps. cxix. 36); love (Deut. xiii. 3); imagination (Gen. vi. 5); grief (Gen. vi. 6); anger (Deut. xix. 6); firmness (Job xli. 24); war (Ps. lv. 21); integrity (Ps. lxxviii. 72); confidence (Ps. cxii. 7); lust (Mat. v. 28); frowardness (Prov. vi. 14); doubt (Mark xi. 23); steadfastness (1 Cor vii. 37); haughtiness (Ps. cxxxi. 1); despair (Eccles. ii. 20); vengeance (Is. lxiii. 4); conscience (1 John iii. 20); deceit (Jer. xxiii. 26); hatred (Ps. cv. 25); madness (Esther ix. 3); mischief (Ps. cxl. 2); pride (1 Sam. xvii. 28); naughtiness (1 Sam. xvii. 28); wickedness (1 Kings ii. 44); envy (Prov. xxiii. 17); terror (Is. xxxiii. 18); humility (Dan. v. 22); uprightness (2 Chron. xxix. 34); strength (Ps. xxxi. 24); singleness (Ephes. vi. 5). Many other equally pertinent Biblico-physiological allusions might be given. But these will suffice to shew the great depth, value and truth of the Biblico-medical philosophy.

Biblical Heredity

The physiological and pathological aspects of Heredity, a comparatively modern study are not only fully endorsed, but even anticipated by Holy Scripture. For it directly or indirectly informs us that not only does Man inherit, like all other animals the form of his species; but also the features, gestures, stature, physical and other traits of their parents or progenitors (Gen. v. 3), but also their mental and moral peculiarities, good, bad or indifferent; as well as their physiological and pathological distinctions; and also their diseases: for example a tendency to inebriety, consumption, gout, rheumatism, and many other ailments. So also do they inherit the tendencies to some diseases; as well as to their frequent repetition; *e.g.* the exemthemata or eruptive diseases. The list includes the inheritance of some of the worst maladies which ruin the health, happiness and prosperity of the legatee as well as their offspring. Indeed the force and truth of the Bible saying that the "sins of the fathers are visited on the children, to the third and fourth

generation" (Ex. xx. 5; Ex. xxxiv. 7; Numb. xiv. 18; Deut. v. 9); long since pointed out by Moses, and more or less observed in all ages, is now only beginning to be fully understood, appreciated and endorsed in its many—widespread—and important bearings, especially from its hygienic or preventive aspect.

Biblical Diseases

These are a large class and form quite a literature; for in its pages the Holy Bible alludes to many different departments of medicine and specialities. Thus for example to surgery (Acts i. 18); midwifery (Gen. xxv. 22); gynæcology (Mat. ix. 20); therapeutics (Ex. xxxvii. 29); nursing (Ex. i. 19); etc., etc. These subjects however, do not form part of our present theme.

Biblical Hygiene

Hygiene, the basis of which is a correct physiology, is even more fully and frequently spoken of in the Holy Bible and even theoretically and practically taught than any other medical subject. Indeed in few subjects does this Book educate us more than in sanitation. As the main subject of the present volume, Hygiene need not be further defined here beyond stating that it embraces all that bears on the preservation of human health—life—and the prevention of disease and death, using these terms in their widest sense, spiritual—moral—social—mental and corporeal. As with other sciences, so with Hygiene advanced students not unfrequently have only to go to the Holy Scriptures to find that their supposed discoveries and new systems and ideas are not only illustrated, but forestalled and even outrivalled by the Sacred Book. This invaluable and unique sanitary knowledge for the various widely distinct, yet closely blent and intimately correlated entities of individual humanity is found throughout the written Word; and, indeed, forms one of its chief themes. But it is especially concentrated and forcibly expressed in the Pentateuch; especially in its last four books. The God-devised and formulated Sinaitic Law consists of a complete series of health codes for the safe guidance of each individually and all collectively, of our multiple human entities in private, public, national and racial life: all of it moreover, given not in Mosaic language, but in the very words of the Deity. This law, monumental not only in the history of the Hebrews but in that of the human race, was revealed as a preliminary to its successor and copestone, the still more elevated teaching of the Saviour, the law of Christ.

The grand Divine scheme for human enlightenment, emancipation from sin, rehabilitation in purity, and education in godliness, was thus most complete—comprehensive—beneficent

—wise—paternal and God-like; especially the rules given for our higher nature and eternal welfare. The delivery of the so-called "Mosaic" law at Sinai and instilling Divine Laws by chosen human teachers, as required, Patriarchs—Judges—Prophets—Apostles—was not only the first stage but also a marked feature in the Jehovistic plan of salvation and education, without which, superintended by the Deity Himself and His chosen agents, not only the Hebrews but the entire human race would doubtless have soon become, as they would even now, as degenerate as they were before the dispersion and the still earlier Flood. Indeed, it would be impossible for human minds to estimate how much the Sinaitic Law in its entirety has since done, both during the Hebraic and the later Christian dispensation, to elevate and enlighten humanity judiciously and aid in evolving wiser human knowledge and conduct infinitely superior to any such as Man could find out or develope for himself without such aid.

The knowledge which the Bible thus supplies as the revealed wisdom of the sole and incontestable authority on the subject; of how to best rehabilitate Man in soul, mind, morals and body; that tells us not only how to cure, lessen and banish, but also how to avoid the manifold evils that more or less constantly beset these different highly unstable departments of fallen humanity, is of exceeding value. The curative and preventive hygiene of both the soul and the body, which teaches us how to keep these inestimable gifts or talents from the sin and the disease either inherited by reversion, or self-inflicted: also how to cure these if already incurred is a most important study. How to keep our souls, our moral nature, social life, mind and body healthy and vigorous; and how to restore these great blessings when either diminished or lost, are all subjects of the most vital human interest and import. Nor is it matter for surprise that both Divines and doctors, in searching every available source of knowledge for hygienic information, should turn to and investigate, as we are about to do, the fount where, after all, we should expect to find it in its purest and most reliable form; namely, in the literary emanations of the Deity, meant solely to instruct the befogged being He has fashioned how to preserve himself and the inestimable gifts He has bestowed, those of soul and body—life and health. Nor is their quest in vain. The Holy Bible gives what no other book, ancient or modern, can directly supply. No literary mine not only yields but initiates more abundant and valuable hygienic lore; and that of the very kind that humanity most requires, than God's supernal and immortal world-book, the Holy Bible, where we find incidentally, yet intentionally, divulged not only what are the many hygienic forces and laws of Nature, but also how these

are best manipulated and controlled, for our human benefit; so as to promote the highest and best interest of our wonderfully and Divinely-blent human souls and bodies; physical and celestial natures. The identical sanitary knowledge that Man so much requires and desires to find is, as with many other things, exactly what the God of Love has bequeathed His constantly and deeply erring, ignorant, yet well-beloved children; offspring still as unwise and thoughtless as were their first parents, the primal ancestral pair. Sometimes this sanitary knowledge is given in an incidental and scattered shape. But in the Sinaitic Code we find it in a specially concentrated form, for Hebrew instruction and use; and also for us of modern times, and for all mankind, to read, mark, learn and inwardly digest by study, for our individual, commercial, national and racial improvement and benefit.

The following pages are the outcome of a critical but reverent attempt to supply an evident want; and to systematize, explain and estimate what is no more than a fraction of the important and practical information supplied to Man in God's Holy Word: namely, the many sanitary laws and hints scattered all through the Book, but especially concentrated in the Pentateuch; the aim of the present volume being expositional and not controversial. Although strictly Biblical, the subject is also essentially medical. And in obedience to the Divine command, "Search the Scriptures," clearly incumbent on the laity as well as the priesthood; devout medical minds being surely the best critics of the Medicine of Holy Writ: even as Divines are of their special department, its still more important and chief theme, Theology. Medicine, like Divinity, is one of the most omnivorous of the Sciences. Alike, their strict but just bar either absorbs and assimilates freely and fully all that is good and true, or at once and for ever rejects the false or bad. Alike they search and co-ordinate both God's Word and His Works for illustration or aid; assured that it is impossible that these latter two or their interpretations, religion and science, can disagree, contradict or oppose one another. A survey like this of the old and familiar but yet ever grand and new Book from a fresh beneficent and scientific standpoint, that of Medicine, throws strong light on the grasp and object of the invaluable sacred volume; which informs us that while it is wrong to endeavour to be "wise above what is written" and pry into secrets "which even the Angels" desire to know; it is still our duty to try to be wise up to all that is "revealed and given to us and to our children," thereby to best ascertain "all the mind of the Lord" regarding ourselves and our kinsfolk the human race; seeing that "whatsoever things were written aforetime were written for our learning." To promote our chief aim,

ensure reliability and Christian acceptability, Scripture has, wherever possible, been interpreted by Scripture; nothing being here advanced but what Scripture plainly says or leads us to infer.

Although the subject is one in which all are or ought to be deeply interested; the book has been written less for unbelievers and sceptics, than for Christians and the Church. What the latter term implies and includes are, fortunately, not left for us to dispute about. For, as there is but one God and one Saviour one common Goal, one Way, one Shepherd, so there is only one Fold or Church of God: which Jehovah has clearly and intentionally defined through St. Paul as "all that call upon the name of our Lord Jesus Christ in every place, their Lord and ours." No true Christian ought to cavil at this, the Divine definition of "the Church:" or refuse to accept it. Denominations merely are branches of the parent tree.

The Holy Bible which Christians accept as their handbook and guide is not universally credited. Hence it is why Bible students consist mainly of three classes. One comprises true believers, who, with grace-opened spiritual eyes aim at defending, endorsing and establishing the Divinity, veracity and trustwothiness of Holy Writ as containing laws from heaven for life on earth, and Man's best and only safe earthly guidebook, that manifests "the Wisdom and the Power of God" (1 Cor. i. 24). A second consists of the waverers and doubters, who honestly and more or less ardently desire to discover the truth. The third are unbelievers who aim at refuting the Biblical inspiration and infallibility; deeming the Bible, utter "foolishness" and our Christian belief mere credulity. These are those of whom it may be quoted "unto this day wheresoever Moses is read a veil lieth upon their heart" (2 Cor. iii. 15). This necessarily includes unbelief in the Mosaic or Sinaitic Law, in its entirety and also in its hygiene, the part we are about to study.

The following criticism is made from the first of these standpoints; and is a contribution to the right understanding of the wide scope of the Holy Word as God's great and complete educational handbook for Man's earthly career; as well as for his highest and best interests in the future. Nor will the conclusions arrived at in any way undermine, but will rather enhance the Divinity, veracity, value, and inspiration of the Sacred volume. Perusal will neither lessen nor disturb the peace—faith—reverence and zeal of any mortal: or militate against the authority or position of any Christian Church: as it has not been penned on the lines of the "higher" but on those of the "highest," and to God--fearers and God-seekers the only acceptable criticism, that of the Christian. It is not mere worldly intellect—learning—science or philosophy that

open the eyes of the soul to realize and accept Gospel Truths and the deep things of God: secrets so oft revealed to the unlettered and the infant (Mat. xi. 25). To ascertain whether any thing—law—idea—or fact advanced in God's Word is veracious and reliable, it is necessary—even for the Christian—to investigate the Sacred Volume with a calm and unbiassed mind as did Sir Isaac Newton and Sir David Brewster, its Divinity the Rev. Dr. Thos. Chalmers, and many other kindred souls its science.

But even believers are apt to make mistakes regarding certain parts of the Holy Book: and in few matters more than on the subject of this volume. The Christian world has of late years been deeply gratified at the success of the explorations carried on among the mounds—tombs—and rubbish-heaps of the ruined Cities of Bible lands, especially Babylonia—Assyria and Egypt, because they have contributed so much to endorse Holy Writ by corroborative evidence. Our Christian "faith" in God and His Holy Word was not begotten on physical lines like this, but was spirit-instilled and came in a totally different way. Still, it is comforting for the Christian minority to have their faith in God and His guidebook for human souls and bodies endorsed thus; to help us with greater assurance, to "give a reason for the hope that is within us." Unfortunately, not a few even devout Christians to a certain extent regard no inconsiderable part of Holy Writ very much as they do these Eastern mounds, forgetful that "all Scripture is profitable for our learning;" that the written Word is especially Divine, a revelation from the Godhead, much of it in His very own words, and not the crude, fallible sayings and words either of the old masters—early fathers—old Divines—ancient physicians—or even those of the writers of the Bible, but those of its inspirer Jehovah. Biased thus, how many read the eloquent parts of the minor and major phophets, but seldom work out their fulfilment of their prophesies, mainly because they regard them as archæological and of interest only to Biblical Antiquarians. So, while all Christians revel in the unsurpassed stories—stirring biographies and unique history of the earlier part of the Pentateuch: comparatively few peruse or study the "Mosaic" law in its entirety; although they reverence it because it has a place in God's Word and is clearly connected with the early history, rise and progress of God's chosen people. Such readers do not exactly regard it as literary rubbish, and figuratively akin to the eastern physical earth-mounds. Still it has little interest for those who merely reverence it as byegone history from which little benefit or instruction can be derived by the advanced practical modern minds of the present day. Systematic exploration of this, the medical byepath of Bible

knowledge, and of the literary antiquities of the Bible itself, such as the present effort; would do much to remove this grievous mistake, and would yield even more important results than have the pick and spade in these extinct city-heaps. The sanitary scheme of the Bible, especially that of the Sinaitic Code is perhaps the most overlooked of all of these long half-neglected portions of Scripture. And yet its closer study will lead the truth-seeker to come to certain numerous and most important conclusions, of which the following are the most prominent.

1st. The superhuman and infinitely precious medical lore of the Holy Scriptures, especially its Hygiene or Sanitation adds its special and strong testimony to the veracity of the Divine Volume; as it is supernal, profound — comprehensive — advanced — prescient—and cosmopolite.

2nd. A critical survey of this revealed bequest not only increases the value of the sinaitic code; but completes its role as a handbook for the entire human entity: proving also that the Jehovistic wisdom—love—and forethought for His chosen people of old, and therefore for us, were greater than we even yet give Him credit for: and also that we still do not sufficiently appreciate the superlative wisdom and worth of His Word as the guide-book, both for time and for eternity, revealed by an ever-loving, all-wise and forgiving Creator. Humanity should disdain no aid like this, likely to unravel the mysteries of our human nature and God's love; and, above all, those facts which Jehovah Himself reveals; and does so in order to increase the value—credibility and Divinity of God's Holy Bible, as a life handbook for His human scholars. Not till we have attained the clear outlook and the wider experience, and the advanced knowledge of Eternity shall we fully realize the immense sum-total of the advantages we had while on Earth. But the facts here adduced ought to add considerably to this and to our gratitude.

3rd. The entire Sacred Volume is inspired, and therefore incomparably valuable. But its health-hints and laws, that form so large an integral part of the Sinaitic Code, are of especial worth, because practically and personally utilitarian, regarding what all mankind cherish most, namely life and health. The forces and laws of hygiene, especially those revealed by the Holy Scriptures, are as Divine as the Decalogue. And those sanitary laws revealed from Sinai are given in Jehovah's very own words; a fact which materially enhances their interest and value.

4th. In the Sinaitic Law Mankind received a more beneficently comprehensive bequest than is popularly conceded. The hygienic portion adds materially to its value.

5th. The Hygiene of the Holy Scriptures, especially that which forms part of the Sinaitic Code, was meant to have a material and evident influence not only on the life and health but also on the education of the Hebrews, and reversionally on that of the World.

6th. No Biblical subject, particularly an especially Divine theme like Hygiene, can ever die or prove unimportant or uninteresting any more than can the Holy Scriptures as a whole. On the contrary, the universal interest of the subject as a personal one, will only serve to bring its study into greater prominence.

7th. Every Bible theme and law, especially those to which Jehovah has given such prominence as Hygiene, ought to be of as intense human interest, especially to Christians, seeing that study proves that the Biblical sanitation resembles those archæological mound researches in Eastern lands by adding fresh proof to the truth, Divinity and reliability of the entire Holy Scripture.

8th. One of the most interesting and important chapters in the early history and evolution of Medicine; including the story of the birth of systematic theoretical and practical hygiene; and the information that this elucidation of applied sanitary science was not only figuratively, but also truly and primarily, Divine, is derived, and derived solely from the Holy Scriptures.

9th. The Sinaitic or so-called Mosaic Hygiene does not consist of a few disconnected fragmentary hints, but of a well-developed sanitary scheme, elaborated and codified by the Godhead; and including personal, public, and National departments; all given in the simplest language; the value, comprehensiveness and applicability of which can only be ascertained and spread by such a study as this.

10th. This Mosaic Hygiene forms an integral part of the Sinaitic Code; in other words, it forms part of the "Oracles of God," the donation of which bequest by the Almighty to Man, ranks only next in importance among the countless gifts and benefits bestowed on humanity, to the wondrous bequest of His Son as the atoning sacrifice for human sin. Christ is our Saviour, but the "Law" is the schoolmaster to bring us to Him and teach us how to live acceptably. So is it with

the Divine Hygiene that forms a distinct part of that Law. And whether we act on this or not, let us be sufficiently candid to acknowledge his beneficent forethought for the race in giving us a hygienic bequest of such truth, value, wisdom and comprehensiveness.

11th. No medical man of the many who have lived since Moses, could have penned and interpolated this hygiene: as their writings prove they lacked the necessary knowledge and a sufficiently broad intellectual grasp. Just as no Divine, moral philosopher, or sociologist of any age or country, and for the same reason could have elaborated the Decalogue, or any regal or civil law-giver the civil, political and other laws that combine to form the complete and complex Sinaitic Code. Even Moses himself—and for the same reasons, imperfect knowledge and limited brain-power, could not have constructed the Hygienic laws of the "Mosaic Code." Therefore they could only be Divine and a Heavenly revelation like the rest of the Sinaitic Code. To this conclusion Moses himself and the entire Hebrew congregation of over two millions of souls bear witness. Moreover, Moses himself supplies the Copestone to this evidence by giving the entire credit and glory to God. The Sinaitic Hygiene is undisputably of Heavenly and not Earthly origin: and was devised—elaborated—codified—systematized —and divulged by Jehovah, the Infallible and Premier Sanitarian and Master Hygeist.

12th. The following study of this Divine Hygiene bequeathed to promote human health, life and education will shew, that as to its authenticity—credibility—inspiration—prescience and value in sanitary matters, the humanly-speaking Ancient Scriptures can securely withstand the fierce criticism and fiery crucible of modern secular knowledge and emerge more than untarnished. The study is not a critique of the thoughts of the inspired human beings who wrote the Bible; nor even of the Ancient Classic and Hygienic expert Moses; though he clearly ranks as one of the oldest of the early fathers of medicine; but is an investigation of the hygienic revelation of the Perfect, Allwise—Far-seeing and Supreme Pioneer Sanitarian, Jehovah, who made the sanitary forces and laws, and now teaches them.

13th. The medico-hygienic laws of the Sinaitic Code herein studied are not the only sanitary edicts that compose that early monumental code of laws for human conduct

known as the Mosaic or Sinaitic Code. In this the Decalogue, and indeed every section of the entire Code or "Law," and its every section are sanitary in its widest sense: and meant both to prevent and cure not only the diseases of the human body, but also those of the human social, moral and spiritual or soul-entities; and in short, are sanitary for the whole man. There are few studies more important, tuitionally and suggestively than what Jehovah has done for fallen man's temporal and eternal welfare. Follow these rules scrupulously, and every human being now on earth would be healthier—longer lived—happier—purer morally, social, and spiritually; because the Supernal Hygiene of the Mosaic Code embraces all.

14th. How closely intertwined and mutually helpful are or ought to be the labours of the Doctor and the Divine. Both, as servants of the Deity work in the same wide Human-field; to prevent and cure the same obnoxious evil, namely sin and its multiform morbific results—spiritual—social—moral—mental—and bodily disease; and under the same Master who was the great Physician as well as the great Divine; to whom both professions owe, in addition to the Bible Hygiene, the two supernal preventive and curative aids without which all their human efforts. would be so imperfect, namely the Vis Hygienica that wards off, and the Vis Medicatrix that helps to cure human ailments, and not alone those of the body.

15th. The Sinaitic Code, including its hygienic part is the Divine Law for the later Jews as well as for the earlier Hebrews of the Wanderings. And also for the present Christian as well as for its earlier introductory Hebrew Church. Humanity can be eternally saved alone by Christ's atonement, God's gift and grace: even as the Hebrews of old were healed and kept from spiritual, moral and social disease, by faith and by obedience to the Law. But, obedience to the latter, the spiritual, moral and social Hygiene of the Decalogue and to the succeeding higher Hygiene of Christ's teaching are still required to supplement Christ's atoning sacrifice, for our earthly Christian life of the present day, if we would be saved. Obedience thereto gives proof of our faith and our love; and forms the surest test of the sincerity of our Christian discipleship. So, too, with the physical Hygiene of the Mosaic Code for our mortal bodies: the laws relating to this are still encumbent. Not only are the

laws of Sinai wholly hygienic and preventive as well as curative in their several departments; but they are as binding now as ever, and will be to all time. They are as necessary and binding on the modern as on the Ancient Hebrews; and on the Gentiles as on the latter. They are universal and perennial.

16th. Wonder at the completeness, simplicity, pointedness, thoroughness and comprehensiveness of the Divine Hygienic benefaction to Man, when contrasted with our oft imperfect and uncertain human methods and ideas is also one of the salient thoughts begotten by the study of the Biblical or Divine Hygiene. God's Hygienic Laws are "perfect."

17th. The universal desire for continued body-health which it is one of the aims of medicine to promote, is instinctive and congenital: as is also the craving for happiness and soul health, which religion is meant to gratify and promote. Together these two should minister to the chief necessities of our body and soul; the entire man. Divinity and Medicine therefore claim and ought to enjoy our high sympathy, be our main studies, and cultivated with no narrow bias or basis. The World and Man have but one true God and one Saviour, one true Church and one Guide Book. Christianity is for all men without reference to colour or country. Like the Holy Bible, so its incorporated Hygiene is meant and adapted for all men, civilized and savage, Jew and Gentile, bond and free. God's legacy was bequeathed not for the Hebrews only, but for the world, and all sorts and conditions of men. Its rules for keeping and restoring the human health and vigour and happiness are universally applicable to the bodies and souls of the entire brotherhood of Man.

18th. The entire Holy Bible and its contained Mosaic Code are inspired; being Jehovah's handiwork, both in conception, elaboration and codification: and therefore incomparably valuable. But the Hygienic laws which form so integral a part of the Sinaitic Code are of more especial value, because given in the very words of God Himself.

19th. Over three thousand years ago, Jehovah beneficently gave to the World and practically initiated and tested on the Hebrews, His Laws and Law Code of Hygiene; including the principal base facts of this, the chief department of the science and art of Medicine, namely Sanitation: then and thereby inaugurating a new Era and a new practice of Medicine, the Preventive: a fact

which subsequent ages have ignored—neglected—despised and depreciated on the score of antiquity—puerility—meant for the wilderness or the early Jews alone &c.; forgetting that all that Jehovah advises for human health—welfare and hygiene, is for the race; mankind being practically, that is anatomically and physiologically indentical in all ages and climes: and that the Jehovistic dictum is not only inspired, but final.

20th. Although the Holy Bible is not a professedly medical treatise, the contained Sinaitic Hygiene and the Biblical Sanitary science generally are not antiquated —obsolete—or purely Jewish; but are exceedingly valuable, widely applicable and lasting: and in their authorship — priority — originality—breadth—comprehensiveness and universality they are unparalled; so that a close survey will cause even medical minds versed in modern scientific and practical medicine to wonder at their profundity, inasmuch as they lag behind none of the other codes, not even the Decalogue, for wisdom. They are more reliable than anything human of any age or authorship, because they do not consist of the crude half-formed and oft erroneous searchings and gropings into the still dark and unfathomed hygienic secrets of Nature by some early and advanced, but yet fallible medical mind; but are the essentials of Hygienic science, conceived—codified and divulged by the unerring Master-mind, and All-wise Being who evolved not only the Hygienic forces and laws by which these are controlled; but is also the architect of the race for whom these forces and laws were devised. The Hygienic ideas of the Infallible Jehovah are irrefutable, whether for the body—mind—morals—social life or the dominant soul.

21st. The human race would now have been medically and hygienically healthier, happier, longer lived—and freer from disease had they from the first followed the Jehovistic advice in sanitary matters; instead of ignoring it for ages.

22nd. The Hygiene of the Sinaitic Code is not in the main annulled like the Hebrew ceremonial law: but, like the Decalogue it is perennial and meant for all time.

23rd. It is both the duty and the privilege of the Medical profession to expound and illustrate the Jehovistic Hygiene; as it is for the manifest benefit of the laity to receive and carry it into effect. To refuse, evade or

forget is to disobey the Commandments of God, not those of Man.

24th. By thus supplementing the laws bequeathed to Man for preserving the present health and future welfare of Man's higher nature, soul and life, and for preventing the spiritual or sin ailments; with an additional and appropriate Hygienic Code for the human body; so as thus to complete and formulate a Sanitary Code for the whole Man and his every entity, soul, mind, morals, social and political life, and body; Jehovah clearly manifested the comprehensiveness of His God-like sanitary legislation for the rebel human race; and the deep love of the Divine Father for His wayward children.

25th. Our confidence in God's Holy Handbook as His immortal trustworthy and marvellous guide for Man; should clearly be materially enhanced by a study of His Hygiene.

26th. Humanity at large and not unfrequently Christians, scarcely yet realize how much Jehovah has contributed by His laws, especially the Sinaitic, to the education and elevation of the race: or estimate the value of the Sinaitic Code in its entirety; so much simpler and altogether in advance of our human pioneer gropings; by which that evolution and development have been so largely accomplished. Nor is the world fully aware that the gift of a practical knowledge of the science and art of Hygiene and its leading factors is one of the myriad ways in which the Supreme has proved His beneficence.

27th. Biblical medical science and religion, God's works and His Word are thus so far found to agree. And as they have the same Author, Christians would be surprised were it otherwise. What discord can there be between God's accurately translated Word and God's science, correctly deciphered from His works as found in Nature. Moreover, the Jehovistic illustrations of Hygienic Science found in the Holy Scriptures and criticised in these pages, not only corroborates and endorses, but also anticipates our purely human expositions of this medical speciality by some thousands of years.

28th. So that it is largely with the Medicine of the Bible as it is with its other departments of knowledge. Modern scientists discover laws; philosophers form systems; poets and sages elaborate new ideas; lawgivers and politicians branch out into what seem new

fields of study; as do sanitarians; to find too often that they have long since been forestalled and outvied by the clearer insight, wider grasp, and fuller nay perfect knowledge of the Divine Sanitary Educator, as pourtrayed in His Holy Scriptures.

29th. For all this beneficence it is surely our human duty to give God the glory which is clearly His due for revealing His masterly laws of Hygiene. And also to honour Jehovah's servant Moses for his far humbler share as the receiver and transcriber of this superb donation to Man. And furthermore is it not our duty to spread this invaluable information "among the nations" (Matt. xxi. 14). We laud our gifted men and women for their wonderful thoughts, words and deeds. Can we give the Deity too much praise for His Hygienic bequest? Or is it possible to study what He has so graciously bestowed too deeply?

Conclusion

Thus, as with other Bible sciences, so with Medicine, the deeper we study, the more we marvel and the more urgent become the two prominent questions; whence its source, and what its purpose. Can there be a doubt that the astronomical, geological, ethnological, chemical and other findings, divulged through Moses, Job, Peter, Paul and other heaven-selected Bible writers were one and all revealed. For, none of those sciences were known so fully in their day as they propounded them. Nor could the people of that day or of subsequent times have discovered the author of them all, but for this Biblical revelation. Nor can we doubt that the ultimate object of it all was the education of early humankind in accurate and true knowledge of utilitarian kinds, and to incite to further study. Or can we doubt that in like manner the medicine of the Holy Scriptures was of Divine origin and revealed for a similar purpose, human enlightenment in matters that closely concern all humankind individually and collectively, namely their corporeal, social mental, moral, and spiritual health and life hygiene; a subject intimately allied to our general welfare and happiness for time and for eternity. The Deity could have chosen few earthly educational matters of more importance than these; the prevention of disease, prolongation of life, and improvement of health. Jehovah's advice on these subjects is the earliest on record; and in value is still far ahead of all human teaching; as part of the eternal God-conceived and formulated laws of the Universe.

That wonderful compendium of knowledge God's Holy Bible

is essentially an educational handbook and in every sense the best the world has, or ever shall possess; as it is superhuman; and no human being or combination could make such another. And it speaks on subjects still beyond our ken and from a higher plane than ours on matters far above the reach of any purely human volume. Nothing could or would emanate from the Deity and God of Truth except perfect and infallible wisdom. On whatever subject Jehovah deigns to give advice to those He loves so deeply and eternally, whether the subject is literature—science—philosophy—divinity or medicine, we may be sure it is the very best and most reliable that humanity can possess. The Biblical education was mainly meant for the intellectual life and standard of the earlier undeveloped and comparatively ignorant ages. For centuries on how many subjects besides theology has not the Holy Bible been instructing Man and giving educational information of the deepest, most reliable and practical kind, often pioneer in its nature, because emanating from the best of sources, the All-Wisdom. Would not our general education, Medical Hygiene and otherwise; as well as our knowledge of spiritual, moral, social, and corporeal affairs have been much earlier and further advanced if the Divine instruction, so freely and gratuitously given, had been more generally credited and received, than for various unwise and ignoble reasons it has hitherto been by the majority of mankind, even by the Bible favoured nations of the world? The best of all Teachers is the God who made us; knows best what we are, what we need, and of what we are capable of receiving. The best of educational handbooks is His Divine Volume, which like no other book contains information derived from the All-knowledge. The study of His gift, of His educational methods and the nature and instruction His volume contains, is therefore a matter of the very highest and first import and interest. The more deeply we study God's erudite educational handbook, the more wise and learned does it appear. Candid minds cannot help concluding that, altogether apart from our Heaven ordained Duty there is no better Teacher to listen to than the Deity, and no book in the world more worthy of our constant tuitional perusal and obedience than the Holy Scriptures bequeathed by the All-love for this express purpose; a purpose which includes Man's emancipation from the sin to which he has and is still continually enslaving himself: his moral—social—mental and spiritual enlightenment and elevation —happiness—re-habilitation here, and the ultimate attainment of God's approbation, and finally the heavenly life. No teaching—volume—or kind of education has had or ever can have a more beneficent and satisfactory outcome for time and for eternity than the Divine. Nor can the Holy Scriptures and the

educational information they contain ever become antiquated—unreliable—worthless and obsolete any more than can their Divine Author and ours. As new scholars enter earth while older ones leave, they find the Holy Scriptures ever fresh and full of most valuable and divine educational instruction. The Biblical training of the Jews and through them of the human race is not speculative but essentially practical.

There has always been and there still is much popular ignorance even of the elementary facts of science, and with none more than medical philosophy. This would have been and would now be at once dispelled by more widespread disseminations, belief, and more frequent perusal of God's Holy Scriptures, such as the Deity obviously desired and still inculcates, not only for ourselves but for our children; in his superlatively educational Bible, now so accessible even to the poorest, most isolated, and most benighted.

CHAPTER III

BIBLE HYGIENE INSPIRED AND DIVINE

"Hold thy peace and I shall teach thee wisdom" (Job xxxiii. 33; Ps. xxxii. 8).

Is the Hygiene of the Holy Bible, especially that of the Pentateuch Divine and inspired, or secular, recent and interpolated? Is it ancient or modern? Christians, medical and lay at once accept it because it forms part of God's Word; especially as it is given at the divine diction, in Jehovah's own words; and its delivery to Moses in the Holy of Holies practically endorsed, like the Decalogue by upward of the two million of Hebrews who formed the Hebrews of the Wanderings. And they will do this even though they may fall into the error of deeming the entire Bible Hygiene antiquated, obsolete, suited only for a special environment and the early Jews alone. But there is a large class of sceptics just as likely to reject this as they do the entire book. That their doubts cannot be entertained will be shown by the following medico-historic argument which incontestibly proves that it could not possibly be modern or mediæval but of the Mosaic period; and that it could not have been devised even by that specially evolved and divinely taught genius Moses; but is truly, as the Holy Scriptures aver Jehovah's special work and idea, and therefore of inestimable worth: and well calculated to increase our faith in the Almighty Wisdom and in His Holy Word.

For this it will be necessary to attend mainly to that which forms the chief part of the Bible Hygiene, namely the Code delivered to Moses at Sinai: to examine its source, and briefly review:—

1st. The early history of Medicine, especially its hygienic branch.

2nd. The medical history of the Jews, the nation which has contributed most to the development and advancement of this science and art; but also furnishes the best example of their practical application, both in ancient and modern times; and

3rd. The public life of Moses, not so much his birth and early education, as his adult life. Because he is the man

whose works and writings, especially the far-seeing hygienic laws for the guidance of the Hebrews in the wilderness are in their advanced and phenomenal originality, both the earliest and the most pronounced examples of hygienic wisdom extant; and that constitute, especially those on public sanitation, the most important in the entire scriptural collection.

The early history of medicine is so inseparably connected with the Jews, especially with the first of all Biblico-medical writers, Moses; that it is to the medical biography of the latter that we must first turn our attention. As the adopted son of Pharoah's daughter (Ex. ii. 10), and resident at Court till the age of forty, Moses, who lived during the 15th, 16th and 17th Centuries before Christ was, like other Princes, specially educated by the Priests, the custodians of the knowledge of that day, medicine included. These jealously guarded their learning; and transmitted it only or chiefly in priestly channels. But, nevertheless, though he was not being specially educated for the priesthood although really a priest, they made Moses, their special pupil, "learned in all the wisdom of the Egyptians," at that time proverbial (Acts i. 22). Through them he became versed in the literature, philosophy, law, painting, history, religion and general knowledge of that day; and among other things no doubt with medical science. He was suitably educated as a scholar, warrior, and prince of high station. There were no lay physicians then. Nor do we read of them till the time of Solomon, about B.C. 1100. Moses, who wrote so well, lengthily and learnedly on medical, and mainly on hygienic matters, was not even one of those ecclesiastical or priest physicians who devoted themselves specially to the study and practice of medicine. His was a more important and wider rôle. Medical science was only one, and that not the most attractive or important of his numerous studies. And to this science, moreover, we have no evidence that his rank and station either induced or compelled him to give more than the ordinary attention of a general scholar. Although a heaven-instilled impulse may have unwittingly urged him to this in view of future usefulness.

But of what nature was the medical science of that early day; and what the kind of instruction he could receive from the Egyptian Priests, or glean for himself by private study and original research?

Egypt was then the instructress of the World; the cradle of science; and source from whence the nations not only of that but of a later day, derived their erudition and philosophic inspiration. Though wise beyond their neighbours and the reverse of illiterate, the ancient Egyptians were never,

strictly speaking, a highly scientific people. Even their astronomy, a science in which, above all others, they are supposed to excel, was, according to Bunsen, Rausch and Strabo, very crude and empiric. General knowledge was not in a very rudimentary state, seeing that Egypt was comparatively civilized 230 years before Jacob's death; and certain of the arts and sciences had become wonderfully perfect from long experience and centuries of observation. Agriculture, geometry, architecture, metallurgy, had made remarkable progress, as the gigantic cities and monuments of that day prove. Still they early recognised the importance of codifying laws and recording progress in knowledge. But it was very different with medical knowledge, which was of the most primative and elementary kind; as was also the information regarding the human body, of the internal structure of which and its workings they were very ignorant; and of its still more marvellous microscopic appearance still more so: mainly because prejudice, superstition and distaste caused the basis of all medical lore to remain unstudied till more than a thousand years later. This was anatomy and its sequel physiology. Obviously we can never know how to prevent disease until we know its true nature and especially how it is caused.

Moses lived during what has been termed the "primitive age of medicine"; and era of the foundation or infancy of the healing art; a period which lasted to the Trojan War, B.C. 1180. He thus lived at least 700 years before the earliest authentic records of secular medicine, dating this back to Hippocrates (B.C. 460). The priests were then the chief professors of medicine. In addition to Moses and the Egyptian priests history only hands down the somewhat mythical names of Chiron the Centaur, Esculapius the father of medicine, and his two sons Podalirius and Machaon, distinguished in the Trojan War. But these celebrities Moses antedates by 300 years; and, moreover, is not a doubtful personage. The extent of the development of the medical knowledge of that period we may glean from the "Hermetic Code" or Book of Hermes or God Thoth to whom it is inscribed, and whose revelation it professes to be. This manuscript, known to the subsequent school of Alexandria, written in the 16th Century B.C., and, therefore, extant, while Moses lived, consists of 42 volumes, in which all the knowledge of the savants of Ancient Egypt was collected. Of this the last six volumes related to medicine, and embraced a complete and well-arranged body of medical matter treating of remedies, operations, diseases of the eye, diseases of women, and the diagnosis and treatment of bodily ailments, internal and external: and, generally, the accumulated medical knowledge of ages; embracing their own and doubtless that of

previous and cotemporary dominant races, such as the Babylonians, Assyrians and others. These essays prove that medicine flourished in Egypt; and that their acquaintance with many branches of the art, particularly symptomatology, was wonderfully perfect; and that the Egyptians had specialists, such as oculists, dentists, and public medical officers for service among the poor. But they practised medicine in strict accordance with submitted rules; beyond which, according to Dioscorides, they dare not go. And were afraid of experiment, lest their credit and even life might be forfeited. Amid all, however, the subject of Hygiene is conspicuously absent; thus proving that this department of medical philosophy and art was still little, if at all, known.

But if the Egyptians gave to the World no great medical philosopher, their teaching helped largely to develope medical science among the Jews, who so long intermingled with them. For in the midst of this prevalence of absurd theories; an illogical and uncertain practice; and general ignorance of hygienic matters, a Hebrew sage of large thought, wide grasp of intellect and great capacity for generalising and seeing things from a universal point of view, suddenly appears and changes the entire aspect of medical science. This savant, apparently all unknown to himself, was brimful of a new idea destined ultimately to inaugurate another and previously unknown school of thought and action that would change the entire aspect and scope of medical science. An idea that would even then have accomplished this, if mankind had been wise in their own interests, and accepted heavenly educational help, instead of trusting solely to what was of slow human and, therefore, imperfect and uncertain development. Egyptian tyranny having led to the Exodus of the Israelites from the land of bondage under Moses, by Divine guidance; not only was a new departure made in the higher life of humanity and a revival of Monotheistic religion at a time when it was apparently like to perish; but a new and important deviation was made no less in moral, social and spiritual law-giving than in medical, especially hygienic, matters. His logical and comprehensive mind might have given to posterity a masterly summary of the curative medicine and methods of that day. But on this he fortunately did not waste his energies and his time; but gave us instead what is of infinitely more value; and without the slightest idea that after many centuries his veracity and knowledge would be subjected to the test of a strict scientific survey; and emerge therefrom full of the highest honour.

Though reared and graduated in a highly conservative school, Moses did not retain his allegiance to, teach, or practice in it. Made wiser than his first teachers by a higher Educator,

he saw there was something more valuable than curative medicine; and more reliable than therapeutics. He originates an entirely new system of theory and practice, completely subversive of, and indeed totally opposed to the prevailing plans. He departs widely from the undeviating usage, that of therapeutic or curative tactics, followed not only by the Egyptians and other nations of antiquity, but by others of a much later day; and substitutes for it the more philosophic and wiser hygienic or preventive method. Instead of curing disease after it had fastened on the individual, he anticipates this calamity and tries to prevent its advent. He thus not only far outvies his teachers, but advances medical science and practice centuries, nay thousands of years ahead of his age; and gives to the world a health code without a tinge of the absurdities of necromancy, superstition, and astrology there and then so prevalent: by a code containing no extraneous matter, wordy digressions or side issues so common in most of the ancient and even in many much later compilations: a code that embraces rules that "collectively form one of the most precious and authentic monuments of the history of the healing art": a code in which everything concerning health is regulated with great care; and in which the laws, especially the well-defined, condensed and pointed epitome for the *prevention, arrest and ultimate stamping out of that class of ailments which have most afflicted mankind in all ages, namely, contagious diseases*, are so perspicacious, curt yet ample, practical yet logical, far-seeing and efficacious as to compare favourably with, and even surpass, not only in literary merit but in a strictly medical point of view, the hygienic rules in vogue at the present day. Like many another student, Moses had thus gone far ahead of and now taught his early educators, the Egyptian priests. And the germ of his hygienic system, doubtless hazily dreamt of, like the great ideas of many other men, during his early or student life; was probably still more developed and fixed during the long solitude of the second, recluse, or student portion of his career in the Wilderness of Paran; to be still further elaborated and specially endorsed by the Almighty's revelation, first on Mount Sinai and later on within the sacred privacy of the Holy of Holies (Ex. xxxiii. 11); to be delivered to the Israelites during and after their wanderings as a fully elaborated and written scheme (Exod. xvii. 14), fit to be at once carried into practical effect and illustrated on the Hebrews; the rules being doubtless put in force immediately after their inception and delivery, so as thereby at once to prove their efficacy and value as something more than a mere empty and impracticable, because Utopian, theory.

As has been elsewhere fully shewn in these pages, these

Mosaic health laws are neither purely ceremonial, figurative, frivolous, ephemeral, temporary, obsolete, solely Jewish, meant for that early era and particular geographical latitude, country or clime; but are in every one of these particulars very much the reverse. Whence, therefore, did Moses, the pioneer student and teacher of Hygiene; and the first to reduce it to a well digested and practical system; derive the information necessary to compile such a masterly summary of health laws as those spoken of in these pages as found in the Pentateuch? It clearly could not emanate from the Egyptian Priests or their predecessors or cotemporaries. What, therefore, was its source? Was it partly, mainly or wholly Heaven-begotten and inspired and only written out at dictation and under spiritual supervision, like the rest of the Mosaic Code (2 Peter i. 21), by Moses at Mount Sinai and in the Tabernacle, where God spake with him as friend to friend, when necessary, both in this and all other matters relating to his special mission towards God's "peculiar" and "chosen" people?

The concentrated and uninterrupted self-communing of isolation and solitude has often produced splendid results both in ancient and modern times, and done much, not only for nations like the Jews, but the World at large. Thus, no doubt, did the uninterrupted and comprehensive contemplative life of the learned and highly-gifted student Moses, in the land of Midian. Here his talents were developed and led into a fore-ordained channel, best fitted to receive, appreciate and apply those Divine laws so soon to be revealed in all their grandeur to this zealous and God-appointed Hebrew leader, destined for and specially educated to be not only the historian and biographer of these early times, but also the promulgator of those masterly, spiritual, moral, social, civil, ceremonial, political and hygienic laws, specially constructed for God's chosen people, but yet of world-wide and lasting application; since on them are founded all the best and most practical of all codes, both ancient and modern.

The criticisms mooted as to a later authorship; and incorporation in the Bible text with these Hygienic laws by some medical celebrity of more enlightened times, as has been suggested regarding other parts of Scripture, is one that cannot be entertained. And a review of the subsequent history of medicine, especially of Hygiene, will prove:—

1st. That not only did Moses, and he alone, bequeath the sanitary laws found in the Pentateuch; but

2nd. That, humanly speaking, he is the foremost sanitarian that has yet appeared in any age, because Heaven-taught, and a Divinely-appointed pioneer.

3rd. That the Biblical laws of Hygiene, which he edited, are wholly Divine, and the work and words of the Master Sanitarian, Jehovah.

The Greeks succeeded the Egyptians as leaders in medicine, and doubtless derived their knowledge mainly from them. The most prominent Greek Physician Hippocrates (B.C. 460), was the first ancient whose name is associated with the new and very rudimentary doctrine of preventive medicine. But his chief merit consisted in little more than this, that he collected and codified the scattered fragments of existing medical and hygienic knowledge. But what was the depth and intrinsic value of this. Both seem absurdly simple and elementary in the light of modern knowledge; and shew how far ahead the Jewish law-giver was to his Greek successor of 1,000 years later in sanitary science and its practical application. For the Greek rules consist chiefly of six articles, then deemed necessary for the proper regulation of life, or non-naturals, as they were absurdly called; namely, air, aliment, exercise, rest and sleep, wakefulness, repletion and evacuation. But even this Hippocratic collection, a thousand years after the supposed date of the Egyptian Encyclopædia or Hermetic Code, does not present so complete and methodical a system. A fact which proves that thus far medicine, and especially Hygiene, had not progressed very far, even among the most cultured nations of those days.

Further on, during what is termed the "mystical period," that is up to B.C. 500, the science had still made little advance; although the intellectually enlightened Damocedes and Socrates had lived, and Pythogoras, who first made medicine a science. A kind of physiological polygarchy prevailed, "Man appearing to the early sages as a multiplied being, a little representative of the Universe; his body being divided into many regions or departments, which were supposed to be governed by spirits of different orders," which presided over and gave impulse to all the changes and anatomical phenomena that occurred. The custom in sickness was to interpret the oracles, after fasting, prayer and sacrifice. And although the practice of medicine in the temples dedicated to the God of Medicine was largely preventive, as it embraced air, regimen, hope; special curative medicines being also given, this after all was only attention to the Hygiene of disease or curative Hygiene. Whereas the Hygiene of health, for which the Mosaic Code and its practical exponent, Moses, deserve so much credit, was unstudied, or it would have been recorded.

Nor was preventive Hygiene in any great measure advanced during the subsequent or "philosophical period" of medicine which ended in the year B.C. 320. Although during this age

there lived some noted pioneers; famous, however, mainly in curative medicine. For example, Ctesias, Plato, Diocles, Carystes, Praxagoras, Alcmean, Damocles, Diogenes of Appolonia. The latter four have been credited with superior acumen for anatomical and physiological investigation. Aristotle was also a celebrity of that day; but though his anatomy was rough and his physiology erroneous, he propounded doctrines which had a powerful effect on medicine. Hygiene was then not altogether unknown; but it was still rudimentary. Thus, Acron credited with having successfully expelled the plague from Athens by burning perfumes, made one of the first recorded sanitary efforts on a large scale; and that a wise and highly suggestive one, viewed from a modern standpoint. To Hippocrates, another early savant, to whom almost Divine honours were paid in his day, though he knew very little indeed, practically nothing, of anatomy and physiology; we owe a new departure and the germinal first principles of preventive medicine when he expounded the doctrine that causes of disease are to be found in physical accidents of air—earth—and water; in quantities and qualities of food; in personal habits of life, and similar unhygienic influences.

Still later in time, during what has been termed the "anatomical period" of medicine, which ended with the death of Galen, A.D. 200, we find that it was not till the rise of the Alexandrian School of Medicine (B.C. 320) that medical philosophy began to flourish; and that popular prejudice and the feeling of the masses which revolts against the dissection of human bodies, having at length given way, the Egyptian King, Ptolemy Soter, was enabled, in the year B.C. 300, to raise a lofty landmark in the history of medicine by permitting the opening of dead bodies to discover the causes of diseases; and to allow a serious attempt to be made towards the independent development of healthy human anatomy. The latter soon brought anatomy, comparatively speaking, to high perfection; and necessarily caused the curative art to make rapid progress in the hands of Erisistratus, the first to systematically dissect the human body; then of Galen, whose opinions were oracular for 1,300 years; then of Asclepiades, who founded three schools of medicine; and of other noted names such as Allianus, Aroagathos, Dioscorides, Herophilus, Arætœus the learned Cappadocian, Xenophon of Cos, Mantius, Andreas of Crystes, and Celsus, one of whose medical works is still read. This school existed only for a short time; but yet left lasting impressions on medicine and surgery, and established the close connection between these and anatomy. But the progress of Hygiene or preventive medicine was very different; as we glean from Celsus, to whom we are indebted for the most accredited

hygienic precepts of his time. Even that justly celebrated physician, with the exception of making his rules more orderly and precise, added little new to the writings of the Hippocratic collection now spoken of. While his hints were chiefly of a personal, and not of a public nature, like the infinitely more important ones given by Moses. So that, thus far, nothing noteworthy could have been interpolated in the Hygienic Code of the Pentateuch; and still less could the entire code have been so inserted.

During the following or "Greek" period of medicine, which lasted from A.D. 200 to A.D. 640, the medical celebrities whose career has handed their names down to posterity were Adamantius, Œtius, Aaron of Alexandria, Oribasius, and Alexander of Trallis. But none of these added much to the advancement of Hygiene. Theirs was the curative rôle. This era, however, about the year A.D. 500, is remarkable for the appearance of the Talmud of Babylon, a venerable work, consisting of 21 books, which, next to the Pentateuch, is held in the highest estimation among the Hebrews, and is more prized than the Talmud of Jerusalem, composed 200 years earlier. Besides their oral or civil laws, customs and traditions, the Talmud contains many passages relating to medicine altogether different from the elaborate system of preventive medicine of a far more ancient date, found in the Holy Bible. The information to be gleaned from both sources is important. Because, notwithstanding the large amount of Hebrew literature handed down to us, our knowledge of medical theory and practice among the ancient Jews is far behind that of other nations. The Jewish Doctors of the Law, that is their most learned men, selected for their professional aptitude, were the chief practitioners of medicine. Their practical duties were partly Hygienic; because they had to superintend the proper slaughtering of chosen animals for food, and to select the edible parts. But beyond this the Hygiene of the Talmud is chiefly that connected with disease, that is therapeutic or curative Hygiene; and very different from the comprehensive system of the early books of the Holy Bible, written long previously. Their crude medical knowledge and its resemblance to that of other less favoured nations of that day is shown by the state of anatomy, physiology, pathology and therapeutics. They had no more than a vague knowledge of anatomy. Their physiology was somewhat grotesque, inasmuch as they believed very much as the Chinese do at the present day, that the kidneys gave advice, the heart understanding; that the lungs absorbed liquids; the liver generated rage; that the spleen threw bile upon it to calm it; that the spleen is the seat of laughter; while the trachea and Œsophagus are the two structures most essential to life. Their

pathology was equally vague and unnecessarily minute. Their symptomatology and etiology were very indefinite. All this proved that the Jewish Professors of Medicine were not a whit further advanced in knowledge, not even in their own art and science, than those of cotemporary nations. And it shewed that the mantle of Moses had not descended on any of them to enable them to materially advance medical science, far less to invent a new procedure and system of Hygiene for interpolation in the Pentateuch, in any degree comparable to that of their first great law-giver, Moses; whose shrewd judgment and common-sense is much enhanced by contrast. And, further, that with singular and culpable obliquity of professional judgment, they even failed to recognise the true and rare value of the Hygienic Code not only promulgated, but proved to be so effectual by their own sage and noted countryman, Moses; a patriarch of whom in other matters they were so proud.

Descending the stream of time and coming to the "Arabic" period of medicine, which extended from A.D. 640 to A.D. 1400, that is from the end of the "dark" to well on into the "middle" ages; the leaders in medical science best known and esteemed were Actuarius, Colot, Ardern the reviver of surgery in England, Chauliat, Avenzoar, Paulus Ægineta, Averrhoes, Avicenna the "prince of physicians," Albucasis, John of Gaddesden, Rhazes, Hally Abbas, named the magician from his knowledge, Gilbertus Anglicanus, Pitard, founder of the College of Surgeons of Paris, Scilicete, and Ammonius. During this long stretch of 760 years, of all the departments of medical science, Hygiene, next to anatomy, was the latest cultivated. Governments were too much occupied in maintaining and extending their dominions, and rarely enquired into what concerned public health. Private Hygiene was equally stationary. So that for several ages the "Regimen Sanitatis Salernitatum," or maxims of the School of Salerus, chiefly of a dietic nature, was the only Hygienic Code in vogue. And then none of these great lights of early medical science, although fully credited by the unanimous voice of the profession with having done their share in advancing curative medicine, deviated much from the old routine; or could compile a Hygienic Code for interpolation in the Pentateuch, to be in any measure compared with that bequeathed by Moses.

With the decline of this the Saracenic School of Medicine in the 13th Century, the daylight of science for a time went down, and an intellectual darkness, medical, scientific and philosophic, prevailed for 300 years. The true science which budded forth with Hippocrates was stifled by the systems of his successors. These consisted of shallow specious speculations and vain imaginings and superstitions that brought the efforts even

of the foremost men of the profession to low esteem: too often hindered and injured the progress of scientific truth, discreditable to the talent of their originators; only gave proof of the credulity of those on whom they were practised; and suffice to provoke alike our amusement and our amazement. It is interesting to notice that the early thinkers during the darker ages were Jews. It is mainly to the Israelites of the period that the lights of science and general knowledge were kept burning. To them were largely due the founding of the early schools of Spain and France, which were the foci of learning, an accomplishment then not only rarer but also more concentrated and not so spread over the masses as it is now. But, strangely, even the Jews seemed to have made the sanitary code of the Pentateuch a dead letter; and regarded it as meant not for the present and perpetual application by the world at large; but solely for a past emergency, and a critical but bygone period in the past history of their own nation. We look in vain over Jewish medical works of that day for even a reference to the medical lore of their own Pentateuch, its sage sanitary instruction, and its manifest bearing on modern Hygienic problems.

And although on the revival of letters during the "Erudite" or "Renovation" period of medicine, which lasted from A.D. 1400 to A.D. 1600, the attention of physicians was early turned to the means of health-preservation and disease-prevention, that is to Hygiene; at first they only copied the teachings of the Ancients. The earliest original writings, those of Cornaro, Lessing, and Mercurialis, during the second half of the 15th Century, added nothing new, and merely contributed to the restoration of Hygiene. That scientific progress, especially medical, was not wholly stationary is shewn by the fact that the first of systematic colleges which arose in Europe was in this age, and was one of medicine. Nor was the onward progress of Hygiene wholly stopped. The Romans did much practical good in advancing it in the way of baths, sewerage, and water supply, all of which they carried to high perfection; thereby promoting public and private cleanliness, one of the most important of health-preserving indications. Their Cloacœa were marvellously constructed, and promptly carried away all excretal matters from inhabited neighbourhoods. And their equally large aqueducts, which supplied every urban quarter in such volume as kept the Cloacœa constantly flushed. A partial clue to the comparatively slow advance of Hygiene is to be found in the fact that the Church did not grant permission for the dissection of human bodies till the beginning of the 14th Century or era of Church Reformation. Like the Egyptian and other Priests of former times, so the Monks now cultivated the arts of medicine and surgery; the Monasteries being almost

the sole seats of learning prior to the establishment of Schools of Medicine. Thither the sick and wounded resorted for succour and sojourn. In the Middle Ages the Jews were the leading intellects of the world; and gave it merchants, manufacturers, college superintendents, scholars, poets, statesmen, philosophers and doctors. Fauriel affirms that during the same period their medical schools were of the highest importance. While Milner speaks of the superior intelligence and education of the Jews in a period when kings, nobles, and even the clergy, could not write their own names. They were the physicians, ministers of finance, to nobles and monarchs; making their rise thus to higher distinction. Still none of these contributed to the advancement of Hygiene. And how much they must have neglected the teachings of their own countrymen, the leading medical intellect of all who had yet appeared in the World, must be obvious.

The year 1518 is memorable in the history of medicine, inasmuch as then it was that Linacre obtained from Henry VIII., through Wolsey's influence, the Charter of the Royal College of Physicians of London, "whereby medicine was rescued from the tender mercies of the ecclesiastical profession" and became a profession and a science on its own basis. Thereby medical science pursued for the next two centuries uninterrupted progress, untrammelled by the former clerical domination and bigotry which too often retarded the progress of this as it had long done other sciences. The conflict, however, long carried on in that age, was not really between science and religion; for these spring from the same great Author and based on infallible truth, can never disagree; but only between the two classes of men who studied and interpreted them; between scientists on the one hand and theologians on the other; both fallible and short-sighted, because human; and often in error, yet too often unwilling to admit their mistakes or mistranslations, even when these were clearly pointed out and abundantly proved. So that even up to this comparatively recent period of the world's history, who of all the medical lights could have conceived, constructed or interpolated such an admirable health code as that given in the Pentateuch: even though the best of authors and discoverers embraces names like Vesalius the "Father of Anatomy," Pare, Aristarchus, Fallopius, Beranger, Brissot, Bradsdorph, Cæsalpinus, and Chares?

Since the last-mentioned era medicine has passed through the "Reform" period, which lasted from A.D. 1600 to A.D. 1800. And has enrolled many other noted names and original minds; for example, Harvey, Boerhaave, Fabricius, Ferdinandes, Gilles, Scultetus, Heister, Albinus, Ruysch, Degraaf, Allioni, Bertin, Berbendie, Galvani, Dieffenback, Galbinus, Fabri-

cius, Fernandi, Fothergill, Gregory, Blumenbach, Boyle, Brodie, Cheselden, Cheyne, Cline, Courson, Cullen, and many others of honoured memory, chief among whom we may cite the celebrated philosopher, Descartes, a hard-working dissector and experimenter, who aptly epitomized the progress of medicine by saying that all we know is very little as compared with what remains to be known, a remark the wisdom of which modern science is daily making more manifest. And he further shewed the main aim of medicine, thereby foreshadowing the chief object of Hygiene, by remarking that mankind might escape an infinity of diseases of the mind no less than of the body, and even, perhaps, from the weakness of old age if we had a sufficient knowledge of their causes and of all the remedies with which Nature has provided us.

Again, in the last or 18th Century, the equally famous names of Hunter, Jenner, Heberden, Helvetius, Fothergill, Malphigi, Petit, Mead, Meibomius, Desault, Pinel, Le Dran, Sabatier, Riolan, Ruysch, Louis, Portal, Chopart, Mirand, Moreau, Pott, Sanctuarius, Sauvages, Scarpa, Cheselden, Spigelius, Steno, Valle, Monro, Lancisi, Morgagni, Bertrandi, Scarpa, Richter, Haller, Rush, Arbuthnot, Baudelocque, Bayley. But, notwithstanding this galaxy of talent who adorned the twin branches into which the art and science of medicine was first divided, namely surgery and physic; so slow has been the progress of true, practical and theoretic Hygiene that it is only within the present age that it has been systematically studied, and so perfected as to have assumed the dignity of a science. So that, like every other science and art, that of secular sanitation likewise had its infantine and its empirical stages. Nor was it till anatomy and its ally and sister science physiology were systematically studied, that that other science which is mainly the practical application and outcome of the latter, namely Hygiene, began to emerge from its first or empirical stage and was placed on a high and scientific basis. Not till then was it clearly seen that strength of body, age, life, and happiness are best ensured, not by alchemics and visionary chimeras but by strict attention to the laws of Hygiene. Since then, however, it must be confessed that a quicker advance has been made in the same period in rational Hygiene than in rational therapeutics. The comparatively subordinate position and slow progress of sanitation in civilized countries may be estimated from the Hygienic Acts now and again met with in the legislation of the period, even in England. Thus in 1838 an act was passed imposing a penalty of £20 on those who cast animal filth or refuse into rivers and ditches, a wise statute which should still be enforced. A few centuries later we find an act for prohibiting the slaughter of cattle within cities and

boroughs; a judicious law too often forgotten at the present day. In 1552 Shakespeare's father was fined for depositing filth in the public streets; and again in 1558 for not keeping his garden clean. But it was the alarm caused by the ravages of cholera in 1830 which gave the first great impulse to sanitary reform in England and called attention to overcrowding of towns, pollution of rivers, and other insanitary conditions. Still it was not till the Public Health Act was passed in 1848 that sanitary legislation began in real earnest. England, then as now, the acknowledged pioneer and leader in Hygienic work, may be said to have began her sanitary reformation in this year. It may be laid down as a law prevalent in almost all countries, that sanitary matters are too often neglected till some calamity, actual or imminent, calls urgent and instant attention to them. So it was in England. For it was not till the death of a Royal personage and the dangerous illness of another some years later, that the neglect of sanitation throughout Great Britain, even in Palaces, was rendered apparent, both to rich and poor; and that public attention was called to the cause of those fevers and other infectious diseases and filth ailments. Then it was that enquiry, medical and municipal and governmental, revealed how bad the drainage was, how overcrowded the blocks, and how festering the abominations in our midst. Not till then was a matter of equal importance perceived; namely how apathetic were landlords and even public officials; how ignorant, stubborn and blind are tenants and the public generally, even the presumably educated, to dangers lurking in their very midst, and slow to take obvious sanitary measures by which these might be counteracted. Between 1848 and the Sanitary Acts of 1870 many useful measures became law. And at the present day scarcely any Session of Parliament passes without some valuable addition to the sanitary welfare of the nation and its communities. These embrace the regulation of factories, workshops, churchyards, baths, wash-houses, lodging-houses, vaccination, food adulteration, nuisances from smoke, river pollution and such like.

In accord with and as a result of this, the progress of sanitation for the past 30 years has been very satisfactory. But that there is need for further attention thereto is evident from the simple fact that public health, though materially improved, is still very far from what it ought to be, especially in certain districts and under certain conditions.

To effect these pleasing results many eminent medical minds have contributed their quota. But it would be difficult to select from the galaxy of great names who have helped this work and adorned the beginning of the present century. Broussais, Lister, Falconer, Bell, Baillie, Good, and Blizzard may, how-

ever, be mentioned. With these some of the leading men of the present day will not lose by comparison. Although, as yet, it would be invidious to attempt to assign to each his exact position in the roll of honour. This must be left to the calm scrutiny of history. But these lists include the master minds of the most philanthropic and self-denying of all the professions, that of medicine. And they include the leaders in every one of the different branches into which the steadily increasing sum of medical knowledge has since its advent been divided. First, the two great divisions of medicine and surgery. And, subsequently, its rootlets, anatomy, physiology and therapeutics. And in later days that special branch, one of the most important and far-reaching of all; that in which we are now chiefly interested, namely Hygiene; already further on the road to perfection, both as an art and science, than most of the others, and which claims not so much to be a branch of curative medicine, but a sister science and advanced philosophy, which forestalls disease by warding it off, thereby obviating the necessity for cure. These names include the leading literati and philosophers; those whose professional experience, experiments and writings have developed the art and science and brought them from the almost complete ignorance of its earliest days to its present comparatively high state of efficiency. But none of these many men since the days of Hippocrates onwards, even the chief exponents of physiology, that department of medicine which is the basis and pioneer study of all sanitary science; none of these notable names, not even those of Haller, Harvey and Hunter possessed the necessary knowledge and acumen to practicalize their special duty by utilizing it in a hygienic direction, as did Moses and his Supernal Teacher. Esculapius was one of the Fathers of Medicine: Hippocrates, whose science medicine was called, had a master mind, and Galen, who built up his fame, and was the prince of physicians; Vesalius, the first discoverer of the true structure of the heart and the restorer of scientific anatomy; Servetus, who in 1553 first suggested a distinct expression of the so-called pulmonary circulation, by which the right and left sides of the heart are connected; Avicenna, the greatest of the Arabians; Oribasius, of the 4th Century; Œtius, of the 6th Century; Paulus Ægineta, of the 7th, were all noted men: Cullen had a world-known name beyond medical circles; Sydenham was the most enlightened physician of his day; Haller has been justly celebrated; and Harvey for his immortal discovery of the true course of the human circulation and inauguration of a rational system of physiology; Hunter, for his deep and wide anatomical and physiological researches. But does not their work and fame pale before the magnificent health-saving and life-prolonging

laws and generalizations of Moses: laws applicable not to leprosy alone but to that large—fatal—much and justly dreaded class of diseases called the zymotic, infectious, and contagious: a class which has cost the world so many lives and involved individuals, families, communities and nations in so much misery? a class of diseases much larger than once supposed and that is drawing into its vortex many dire ailments once supposed to be of a very different nature. Medical schools have risen and fallen; doctrines have been made and unmade; philosophers have theorized and been forgotten; but a far older teacher than all, Moses, with his Divinely-derived creed, stands unanswerable, incontrovertible and unchanged. His, the first school of Hygiene and the longest lived, stands stronger than ever. None of his successors had a sufficiently utilitarian mind to bring down their professional knowledge of physiology and apply it in a sanitary direction, so as to benefit their fellow-creatures in the most beneficent of all directions, by lengthening their days and lightening their load of disease. Not one had grasp enough to give, for the benefit even of their countrymen, and still more for the good of all mankind, even so much as an outline of sanitation; far less so masterly and complete a summary of its abstruse doctrines, as did the ancient Hebrew.

Nay, what was the position of Hygiene no more than fifty or even thirty years ago? At that day neither was public nor private Hygiene taught in any school, college, or university. Professors seldom or never alluded to the subject. Health officers were unknown. Both the science and the art of modern preventive medicine were still in embryo. Books on Hygiene were rare and rudimentary, not often read, and seldom acted on, but relegated to the curiosities of medical literature. Sanitation was regarded as one of the side issues and byeways of medicine; to be dabbled in by the curious or dilettante student; but shunned by men of the "practical" school, who thought that science in almost any form, even in this shape, should have no place in the curriculum of any school, or hold of any medical man, whether physician or surgeon. Now, however, all this is changed. Hygiene is fast taking its place as the most important of the two great primary branches into which the medical art and science are divided. Hygiene is no longer merely as of yore, a copying of old ideas only and of all medical ideas save those of the Holy Bible and Moses, but a wonderful development of new ones, coupled with a careful sifting of the true from the false in past practice and former theory. In this combined weeding and adding process much has been discarded and much rehabilitated. But the writing and the work of Moses, both theoretical and practical has withstood the test and not only survived the closest scrutiny and criticism; but still

stands unrivalled and unassailable in its broad outlines, and still offers points in advance even of the foremost modern teachings.

Singularly enough, amid all this reform, formulation of new ideas, secular medical history and sanitary science never seem to have consulted, but rather made comparatively little or no mention of Moses. His incomparable work, and his masterly contributions to the art and science of Hygiene, given ages before these subjects in their modern form were dreamt of even by strictly professional minds; appear to have been ignored or contemned by the medical authorities of all ages, countries and creeds, even Jewish ones. And it may be asked which of the many brilliant medical minds that have immortalized their names since the days of the Israelitish Exodus had the necessary knowledge to compile or evolve such a complete code of health laws as did Moses? Which of them all has played a more important or even equal rôle in the development of Hygiene than this "Man of God?" And although the position is one not usually assigned him, who has contributed more to sanitary advancement; or made more numerous and valuable additions to its progress? Nay, have not his claims as a sanitary pioneer and leader not been singularly enough almost completely ignored by ancients and moderns alike? Have not even Hebrew medical men, some of whom have made names of note both in ancient and modern times, failed to perceive the grasp, cogency, and truth of the Hygienic writings and sanitary acts of their great fellow-countryman Moses, whom in other matters they venerate so much.

Another pertinent fact must here be noted; namely, that the development of modern has followed the same direction as that of ancient Hygiene. And that the results of human experience, reached by tardy steps, and by a totally different process, namely that of long continued professional observation and experiment, are found to be very similar, and, indeed, identical with the mainly theoretical, though oracular, conclusions of the Israelite. Nothing new has been discovered; nothing new has been added. Nor has the old Jewish sanitary law been abrogated thereby, but only corroborated. Neither can it be denied that these Hygienic laws, written during the youth of Mankind, by the most noted of the fathers of the Hebrew race, are in many respects at least equal to, and in some noted instances even better, than those now penned in this its riper age. Neither can it be gainsaid that modern knowledge and the accumulated secular wisdom of ages have not in the slightest weakened; but, on the contrary, only strengthened the teachings of the old and the New Testaments, and proved that scripture and science do not in this matter disagree, but the reverse in every particular. Nor can it be contested that neither

as a science nor as an art has sanitation yet attained, practically at least, though not perhaps theoretically, the perfection it had reached in the days of Moses; whose Divinely donated health laws are centuries ahead of his time. For where is the modern city—town—or village, even in the most civilized and medically enlightened country that is as clean, well ordered and hygienically perfect as was the Hebrew camp? Where is the community whose system of quarantine, separation of the sick from the healthy, refuse removal, cleanliness and so forth, are so complete and efficacious. Or where is there a community whose public officials and private citizens were so well instructed in hygienic matters, and compelled to carry out minutely so complete a system of public and private sanitation, as were the Jews and their Levites—Priests and Leaders? Or, except in the case of God-sent and sin-punishing epidemics (Numb. xi. 33), where is the modern community that was or is so healthy, both individually and collectively, there having been a total absence of sickness; or one where these and sickness were at a minimum, and present only under exceptional and otherwise explainable circumstances, as was the case in the Wilderness. Indeed, contrasted with the teachings of modern times, the comprehensiveness and sufficiency of the rules and cardinal points comprised in the Hebrew Sanitary Code, primitive in time but not in practice; ancient, but not antiquated and obsolete; comprising a treasure of infallible truth, which is the admiration of all experts; and altogether so remarkable as to be comparable to, if indeed they do not surpass both in literary style and professional excellence, extracts from the best modern works on Hygiene. So that savans, notwithstanding their increased anatomical and physiological knowledge the accumulation of ages and the result of modern enlightenment and civilisation bringing with them vastly improved facilities for medical study, professional experience in hospitals and communities, may still quote his model work with approval; sit with advantage at the feet of the Jewish sage; and learn in language as concise and forcible as that of the best modern thinkers, not only the great base facts, but even many of the less important minutiæ of the art and science which they study; if they would not continue to despise this authority because he is a Hebrew; ignore his work because it is Asiatic; slight the book in which it is found because it is not a rare, costly and abstruse volume; spurn instruction on a scientific subject because it comes from a Biblical source; and neglect the ready-made and divinely inspired code because it is ancient and a non-professional publication.

The exact chronological position of Moses is sufficiently definite and well attested. He is no mythical personage. And

the marvel regarding his hygienic code lies in the fact that this is the first medical treatise of the kind extant: and that so complex, yet so complete a system, should have been penned at so early a period in the world's progress; and in the very infancy of medicine; nay, before reliable secular medical history may be said to begin. And the question naturally arises, whence did this ancient Hebrew Hygeist procure the information or derive the acumen to devise and practically apply this superlative system of sanitary law? How is his bona-fide "advanced thinking" to be accounted for? Is it of human or supernal origin? Were those rules merely an accidental legacy bequeathed by ancient phenomenal talent, unaided spiritually any more than the great pyramid was celestially? Or did God take such an interest in diseased and suffering humanity as to implant the genius which led Moses to formulate and write these superlative medical precepts found in the Pentateuch; and thus become the founder of a new art and science, that of private, public and national hygiene, unaccountable except as Isaiah ix. 19 seems to point to the great pyramid (2 Peter i. 2). Or, lastly, did Jehovah Himself devise, formulate and reveal these hygienic laws as He did the Decalogue and other codes of the Mosaic or Sinaitic law to His chosen amenuensis Moses, for the Hebrews and the World?

Viewed apart from its source the Hebrew Health Code is an anachronism. And it must be evident that Moses was not a semi-barbarous Jew, but either a secularly scientific or an inspired man. And if we cannot accept the former hypothesis, and think it unlikely that imparted information and unaided intellect could have originated this consummate production; then we must avow the latter conviction, that he was truly "a man of God." But was the sanitary code that goes by his name, or styled the "Sinaitic," his conception or not? This question Moses himself answers indirectly and often; and takes no credit for but disclaims it. Assuredly Moses was not only a man of science and the foremost sanitarian of his own or any other age; but also a man gifted by his Maker with the faculty to discover and appreciate not only the great fundamental facts and elements, but also many of the more important minutiæ of private, public, and national sanitation. Still he takes no credit for the sanitary utterances of the Pentateuch or even says or hints at their being partly, chiefly or wholly self-generated; and his own unaided creation; or that we are purely indebted for them to the genius of their practical expounder. Over and over again he insists and reiterates that they are solely heaven-sent and of Divine origin. Nay, more what he says appears to suggest that his sanitary code was a premeditated and authoritative emanation, which in its elabora-

tion probably occupied more years than any work that has since been handed down to posterity. In early times medical treatises were more slowly elaborated than now; and swayed only by the double patriotism of zeal for his Master and loyalty to his people, Moses had no need to give hasty and incomplete work to the world. In the desert he would have ample time to write his book of the law and the early story of Man and the Earth leisurely. From the Holy Bible alone we glean the great base facts about the Mosaic Law and its Hygienic portion. Here we learn, and by Moses's own handwriting, that he was not their author, but Jehovah Himself; that Moses only *gave* or *wrote* the law as averred by the Saviour (John vii. 19); therefore, that it is Divine and inspired. Moses was merely its earthly recipient and transcriber and applicant. This great fact practically attested by over two millions of Hebrews, who heard the Voice of God delivering the Decalogue at Sinai, materially enhances the value of the bequest, as its supernal nature and origin attests its truth and infallibility. This great honour reserved for Moses, and the culminating fact in his earth history, stamps his character and place in history. Taught by the Divinity as no other man has yet been, Moses thus became Earth's greatest sanitarian and the Deity's ambassador and mouthpiece to Man in sanitary as in many other matters. What Moses wrote was revealed. He penned as he was inspired and wrote what Jehovah dictated in the Holy of Holies. Moses himself attests this, and thus wholly disclaims the authorship. Chapter after chapter begins thus, "And the Lord said" (Lev. xvii.). And thus the Hebrew leader and sage, as has been recorded by his successor Joshua, himself "full of the spirit of wisdom" (Deut. xxxiv. 9), fully deserves this record, "there arose not a prophet since in Israel like unto Moses whom the Lord knew face to face" (Deut. xxxiv. 10-11).

Honoured thus more than any of the greater or lesser Prophets, and more than any other man who has yet appeared on Earth, save John the Baptist (Luke vii. 28), by as many direct and lengthy personal conversations with the Almighty as were necessary for the proper conduct of his heaven-imposed leadership, and his Heaven-directed authorship; are not his utterances more entitled to be deemed inspired than any other more human words in the Holy Bible? His Hygienic laws and entire health code are as much inspired as are the moral law, his biographies and his history. The glory of his sanitary writings, like that of his face, was traceable to the same source. Both were Divine. Admitted into the secret counsel of the Eternal he spake, like the Prophets and other holy men of old, "as he was moved by the Holy Ghost" (2 Pet. i. 21); thus proving that in sanitary, as in other matters, "all Scripture" is

given by inspiration of God. And what part of Scripture is more "profitable for doctrine, for reproof, for correction, and for instruction in righteousness," as well as many other matters, than the entire Hygienic code of the Holy Bible, even the least important section of this—the physical? God is not only in every place but in every plan, sanitary and otherwise. This proof of the superhuman origin of the Sanitary Code of Moses is assuredly another stone in the edifice which includes the Divinity of the entire Holy Bible. Should not this Hygienic Code of Moses, this distinct innovation of a most beneficent and pioneer character that could be conceived, be regarded, like every other new discovery, as a sacrifice on the altar at the shrine of religion and God.

The sanitary laws of Moses, as found chiefly in Leviticus and Deuteronomy, are not only inspired, but therefore incontrovertible; and given for a definite, beneficent and far-reaching purpose. God in his wisdom was intent on educating the Hebrews, and by them the World, not only in true religion and the knowledge of Himself, but also in spiritual—social—moral —and physical sanitary matters; and, therefore, not only taught these Hygienic laws, but proved their efficacy on the Hebrews, by whom they were to be bequeathd to cotemporaneous nations and subsequently to the entire brotherhood of Man. Like the entire Holy Book, and even the Saviour Himself, will not this Mosaic and Biblical health code not only survive much despite and even opposition, but become more and more valued, quoted and followed, with increase of age on its part and of knowledge on ours?

Moses was no doubt learned in the medicine and surgery of that era, and could at last have taught his old Egyptian teachers, both theoretically and practically, especially in sanitary matters, a science of which they knew little, as the germ thought of preventive medicine had not then been begotten. But it was not to be his rôle to indoctrinate the Jews and Mankind in the least important *sanatory* or healing branch of medicine, but rather to initiate its higher and most philosophical department, the sanitary or disease preventing. And to shew both by precept and practice that this is the most philosophic and wisest policy to pursue regarding physical health, as it also is in moral, social and spiritual matters. Part of his beneficent and Divinely inspired mission was to inculcate in those early days the lesson popularly taught in modern times by the trite yet true proverb, "prevention is better than cure": and to illustrate it on the Israelites; to shew that its scope is not only of private but of national, nay racial, import; and applicable not only to his day, but all-time: although grievously neglected in past ages even by medical men. From its Biblical study does not medical

science thereby appear in a new light, and come in the garb of one of the most incontrovertible aids to human faith in the veracity of Holy Writ; the truth of Scripture as the inspired word of the Almighty; God's medical message to Man, sent in His own method, at His own time, and by servants of His own choosing?

The Sinaitic or so-called "Mosaic" code and its Hygienic sub-code, more ancient by five or six hundred years than Esculapius and the earliest human medical records, was not written and interpolated by any modern or medieval medical sage, but is as Moses says, an emanation of his era. And yet, as he himself affirms, it was not his conception, but strictly and entirely Divine in elaboration, codification, and delivery to humanity. Its true Author and Deviser was Jehovah, and Moses merely its earthly recipient, editor and human expounder and applier. For this most important educational information we are indebted to God's Holy Bible, and to that alone. What was the supernal object of the code? It was humanitarian and tuitional.

The large amount of more scattered and uncodified, but yet invaluable, medical and hygienic matter found in the post-Mosaic part of the Holy Scriptures, is also neither interpolated, either in medieval or more modern times; but is ancient and strictly Biblical, therefore equally Divine, though in another and minor manner. All of this shews as minute acquaintance with abstruse physiological, pathological, sanitary, and other medical subjects, far ahead, often by centuries of the then existing knowledge, which was practically nil; and that, moreover, on the part of men who were mostly neither directly nor indirectly connected with medicine. Of these many Bible writers, consisting of Kings, Judges, Prophets, Apostles, most were scientifically ignorant and even unlettered; while only two had the slightest knowledge of or were connected with medicine in any way, direct or indirect, namely, Luke, the "beloved physician," and Moses, learned in all the lore of Ancient Egypt, including medicine. The Biblical medical utterances of these men, therefore, could not have been self-generated; and their existence and revelation are only explicable by the Holy Spirit and Divine Wisdom having inspired brain and pen to think and write what they did. They were one and all supernally instructed throughout. The Hygiene of the Holy Scriptures from first to last is entirely supernal. And whatever is like it, of God, is wholly "perfect," permanent, racial in its application, and, therefore, is, so far, very dissimilar from much of that which is human.

PART II

THE HYGIENE OF HEALTH (PREVENTIVE)

"I will heal thee and will add unto thy days" (2 Kings xx. 5; Jer. xvii. 14; Rev. xxii. 2.)

CHAPTER I

ON

PERSONAL HYGIENE

"Sweet to the soul, health to the bones" (Prov. xvi. 24; Jer. xxx. vii.)

1. Secular Hygiene

Before commencing any study it is clearly wise and indeed necessary to understand precisely and fully the nature of the subject we intend to consider. In the present case, therefore, our first aim should be to define exactly what we understand by the term Hygiene; and also what a Human Being is, whose hygiene we propose to investigate.

All things that possess that mysterious and intangible, but inestimably valuable, endowment termed *life* require certain conditions and surroundings for their genesis, growth and continuance. This is scientifically termed their *environment.* Like all else in Nature, this is governed by certain forces, and these, again, are controlled by definite laws. Both laws and forces rule the lower vegetable and the higher animal world; in the former from the minutest oscillating leucocyte granule or the smallest initial germ of a microbe or micrococcus up to the loftiest Wellingtonia or Kauri Pine; and in the latter from the volvox up to the mammoth whale. To possess a favourable and healthy environment is more necessary for the human race and the beings who possess the most delicate and complex organization as the copestone of Creation than for any other earthly being. The study of these environments, the conditions which influence health and life, and what either promotes or opposes these, and how they act, is termed Hygiene or Sanitation; terms synonymous with health preservation and disease prevention. The importance of the study, broadly viewed, will be evident. That of Human Hygiene is clearly paramount. Each animal and plant of the myriads that exist on Earth necessarily has its own special hygienic environment. Our present subject is that of humanity.

But, a still deeper insight into what a human being is, and how fashioned, and the environment he requires, than that given in Chapter 2, becomes necessary for hygienic purposes. This we glean from anatomical and physiological observation of the minute structure of Man and his endowments. This shews that the human frame is an aggregation of 10 different mutually necessary and helpful *systems*; each of which is composed of certain *organs*, which have special duties to perform for its own system and the body at large; while these organs are again made up of different kinds of *tissue*, *fibres* and *cells*, each and all systems, organs, tissues, fibres, and cells, having certain duties or *functions* to perform to promote the well-being, health and life of other parts and of the entire structure. These systems, organs, and body functions are:—

1. The Nervous System (brain, spinal cord and nerves) for mind and telegraphy.
2. The Respiratory System (lungs), for blood purification and aeration.
3. The Digestive System (tongue, salivary, glands, stomach, liver, pancreas, bowels), for digestion.
4. The Sanguiferous System (heart, arteries, veins, capillaries), for making and distributing blood.
5. The Glandular System (glands and ducts), for making and conveying lymph.
6. The Generative System.
7. The Osseous System (200 bones), to support the soft parts.
8. The Muscular System (about 250 muscles), to move the body and its parts.
9. The Cutaneous System (skin), to keep the different organs, systems and tissues together, and give contour and form.
10. The Special Senses System (eyes, ears, nose, tongue, touch), for contact with the external world.

Moreover, one and all of these different systems and their respective groups of organs have each their special duty or function to perform, to complete the rôle and function of the system to which it belongs, whether that function is motion, ennervation, mentation, secretion, excretion, and so on; and to complete the functions of the body as a whole. These details illustrate the complexity of the human frame. But in order to shew fully how "fearfully and wonderfully we are made" (Ps. cxxxix. 40) we must go still deeper and employ the microscope to magnify and thus disclose the minuteness, finish, and beautiful construction of the individual human tissues. Each of these has its own special fabric and fashion. The muscles, brain, lungs, liver, kidneys, stomach, glands, and so forth, are

all widely different in structure and distinct; each adapted for its own special function; whether that is motion, thought, secretion, excretion, digestion, and so forth. No one can exactly do the work of the other; for example, the lungs for the muscles, &c. Moreover, all work together and harmoniously for the mutual good. Each cell has its own individual life and duty; the sum of these forming the life and duty of the whole organ; and the sum of these, again, those of the body. Such a microscopic examination of the different body tissues discloses that in Man, as in other animals, and also in plant life, the more the parts are magnified and the closer they are examined, the greater becomes the evidence of Supreme design, skill, forethought, and wisdom in their construction and adaptation for definite ends.

But, again, while each cell, fibre, part, organ and system in the body may be said to live an independent life, each, nevertheless, depends on its fellows, and these in turn depend on that of the entire frame. So that while each works separately all work together and harmoniously for the common good and the welfare and health of the body at large. The mutual relation, correlation, and interdependence of the different organs and systems of the human body has never been more appositely described than by a non-professional, but inspired writer, namely, St. Paul, who, many centuries before human anatomy and physiology were studied, says, "for the body is not one member but many." But now God set the members each one of them in the body even as it pleased him. And if they were all one member where were the body. But now they are many members but one body. And the eye cannot say to the hand I have no need of thee; or again the head to the feet I have no need of you. But God tempered the body together, giving more abundant honour to that part which lacked; that there should be no schism in the body; but that the members should have the same care one for another. And whether one member suffereth all the members suffer with it; or one member is honoured all the members rejoice with it (1 Cor. xii. 14-26). Paul therein foreshadows and enunciates one of the most important of anatomical and physiological facts and also therapeutic indications for modern medicine: such as none of the medical writers of that or previous ages could have formulated for lack of knowledge.

As with any humanly constructed physical machine, so with the Divinely devised vitalized one, the human body; this complicated and unceasing work necessitates a certain and constant expenditure of material; the place of which has to be constantly supplied. This we derive from the world around us; the air supplying the necessary oxygen for absorption by the lungs, while the animal, vegetable and mineral worlds give appropriate

solids and liquids for ingestion by the stomach. Thus it happens that the body throughout, the lungs, liver, stomach, blood, and every tissue, organ, cell and fibre of the frame are all constantly transmuting this food and air and drink either into body tissue, body force, secretions, excretions: so that there is a never-ending stream of food being changed into new tissues and force and effete tissues being transmuted for expulsion. The body has thus many different substances to manipulate physically, chemically and vitally. During its active life the human frame has thus to deal with many different materials, either internal or introduced. And in addition to these chemical forces constantly active, we also find all the physical ones as well as accoustic, optical, electric, magnetic, &c., all working harmoniously, and, indeed, forming an integral part of the physiological and vital which dominates the whole, so that there is scarcely a force in Nature which is not represented in the human body. Moreover, these forces are governed by the same or similar laws to those which govern these forces out of the body. So that the universal reign of law which prevails o'er Nature extends to the human frame. Indeed, there is no earthly being or entity on Earth which is so complex as Man, and so minutely elaborated, or in which the existence of so many forces and their corresponding laws may be clearly demonstrated as in the human being; which, therefore, well merits the title of a microcosm or little world. These many different agencies, physical and chemical, are all apt to act and react on one another, either for the good of the body and its health or for its detriment and the production of disease. They may also be influenced for good or evil by corresponding agencies out of the body. And this forms another reason why our body health is apt to be so unstable; why disease is always so imminent, and why the prevention of this, by providing a satisfactory environment to promote a perfect hygiene is so difficult to attain and its study so complicated.

But these physical, chemical, electric and other forces would be inoperative in the human frame and unable of themselves to animate or make it and its different organs and parts perform their proper functions, and in fact live, unless set in motion and kept at work by another still more important and higher force, namely life or vitality. This force also, like the physical ones now spoken of, is governed and controlled by definite fixed laws. Without this force and these laws, transmitted and transferred from mother to the embryo infant, these physical, chemical and other forces would never come into existence or the new life continue to grow. Physical and chemical forces alone can never generate life. This must spring from an antecedent life. Life alone can beget life. This great factor in all organic,

especially in animal existence, life and its laws, originally from the parent are multiplied and transmitted to each new cell, fibre, part, organ and system as the individual grows and expands by multiplication of cells and parts after natural physiological laws. This great generative and constructive force vitality, modifies every one of the corporeal physical forces above alluded to, and makes them vital, physiological or animal forces. Thus we have physiological chemistry, physics, electricity, &c., as distinguished from those varieties which are purely material. Each cell, fibre, and organ in the human frame has its own independent share of vitality and leads its own special life. But each of these individual lives all work together for the common good of the organ to which it belongs, and that of the entire frame. So also if aberrations or disease occurs in one, this affects more or less every other part and the entire frame. But, whether the life major of the entire body makes any one or more of the bodily organs or systems, *e.g.*, the nervous or the circulatory systems its chief seat; or which of them or where it makes its last stronghold ere death ensues physiologists cannot yet tell. Nor has it been isolated, seen, made tangible or controlled. Life is a mysterious something over which Man has far less control than over the physical forces of Nature.

Nevertheless, all of these combined; these multiple and marvellous tissues, organs and systems; those many forces and laws that are so automatic, even those of life the most wonderful and mysterious of all the forces, do not suffice to form a human being. They merely complete his lower or animal nature. He still lacks his most vitally essential part, and that which makes him the copestone of Creation; that which separates and raises him far above the brutes; that which made him before the fall only a little lower than the Angels, viz., the soul, the real individual and true Ego, for which that highly vitalized and elaborated machine, the body, acts as a temporary home, to enable it to see, hear, speak, think, act, and hold intercourse with his fellow creatures, and with the Being who fashioned his wondrous and complicated entity; and be educated by combined self-human and Divine teaching for another and higher plane of existence on separation from its no longer required and effete earthly body, at what is termed death. The human soul is ruled and dominated by other forces and laws than those of Earth, namely spiritual ones, from a realm of which we yet know comparatively little. But these influence our physical body as well as the physical forces now spoken of, for good or for evil, for health or for disease. In what part, region or organ of the body the soul makes its special seat or chief dwelling and main stronghold; or if it is spread over the frame and is universal, is still, and perhaps will ever remain, a mystery. Nor can we

tell what region, organ or part it makes its last foothold on parting from its home at death. No man has seen or felt or isolated a human soul, even his own. Possibly the sight will be the first that greets our newly-opened spiritual eyes when unclosed by death. Like the spiritual force which animates the "living soul" and the physiological life that animates the human frame, these two entities—body life and soul life, and the soul itself are of Divine origin, God-bestowed, Heaven-created, unseen, humanly-speaking, mysterious and immortal. Only the visible physical body is temporal and amenable to material human investigation.

One and all of the myriad different organs and atoms of the human body lives an independent and individual life of its own; and yet one that unites with the rest to aid the life and function of the entire frame of which it forms part. Hence it follows that each particle from the microscopic cell or fibre up to the ocularly visible organ and the entire body requires its own special conditions and environment necessary for its health and life; as the body in its entirety also does. Each, small or large, has its own hygienic forces and laws, like the frame generally. Nor will the thoughtful reader who remembers how very complex the body is and the forces and laws which dominate it, throughout on the one hand, and on the other, how many and complex and potent are the external agents, forces and laws which act on the body for good or for evil, wonder for a moment that Human Hygiene is as complex and unstable as the factors, both internal and external, which govern this. But, one of the chief duties and interests of the soul, that is the real individual, is clearly to tend its own highest and best interests. This necessarily includes not only its own sanitation but also that of its temporary dwelling and organ, the body, by a well regulated and carefully followed hygiene and measures to preserve the health and life of both. Of these two objects, soul hygiene and body hygiene, so closely intertwined and correlated, clearly the former or soul sanitation is for many reasons by far the more important of the two, for the due performance of our earthly rôle and duty, and all the vitally important objects for which Man was individually and collectively placed on Earth by Supreme Wisdom and Love.

The selection of a wise hygienic environment for the human soul and body, so as to keep them in health and life and prevent disease, lies partly in the domain of the Divine and partly in that of the physician. Divines study how to prevent and cure soul diseases; and physicians those of the body and the mind. And yet these closely intertwine in that curious microcosm Man. None know better than Divines how the body, both in health and sickness, acts on the mind and the soul; and these in turn

on that. So likewise is their hygiene closely interwoven; nor can the theme of spiritual and moral sanitation be separated entirely from the study of mental and corporeal hygiene; especially in this its Biblical aspect; and from the standpoint of the Holy Scriptures, where the hygienic interests of the whole Man, in his double nature of soul and body, an immortal entity living in a mortal one, is so fully and clearly set forth, especially that of the true individual and ego, the soul: advice which the free agent, Man, may accept and act upon to his own benefit or reject to his material and permanent detriment as he pleases.

Whether Jehovah created other and previous genetic centres for the Genus Homo, with which to people Earth, beings either of higher or of lower degree and of more or less complex structure or nature requiring a different environment and hygienic surroundings, is not within the scope of the present enquiry. Here we have only to do with the Scriptural Adam and Eve race, whose origin and early history are detailed in Genesis.

A human being, whose Hygiene we are about to consider from a Biblical standpoint, may thus be said to be a fallen and sin-soiled yet God-created immortal, immaterial and invisible "living soul," sent to begin life and dwell in a temporary material body; an entity whose duty, privilege and interest it is to educate himself under Divine guidance for a higher service and more exalted sphere of existence in the pure and holy realms of Heaven: and who while here is influenced for good or for evil by the different forces and laws of Nature, the soul being amenable to spiritual ones, the mind swayed by mental and moral, and the body by vital ones; and all influenced by the many forces and laws external to the body: each of his dominant parts, soul, mind and body, requiring its own special environment and definite hygienic conditions, to preserve the entity and health of his earthly temporal and his eternal spiritual nature, the former lost at death, when the emancipated soul enters its new spiritual body, of whose attributes and form we can now form little conception beyond that supplied by Holy Writ, but whose "welcome" and "well done" greeting of the Almighty will doubtless be according to the attention given by each individually to the welfare and health of both his earthly and his spiritual nature, and, above all, the hygienic education of the soul, God's special property, both in its transient home on earth for its Maker's service and glory and in its eternal abode elsewhere than here.

The human soul as we now find it, so very different from the pure and Holy Edenic souls of Adam and Eve before the fall, has its more or less occasional, yet healthy, heavenly aspirations, varied, often, alas, by more frequent morbid tendencies to sin

in spiritual and moral matters. The latter abnormal aberrations or soul diseases are multiform. Many of them are named and pointedly illustrated in the Holy Scriptures. They are the result of faulty soul hygiene and carelessness in avoiding unhealthy spiritual conditions and surroundings. For example, the Bible quotes unrighteousness, wickedness, covetousness, maliciousness, envy, murder, strife, deceit, malignity, whispering, backbiting, insolence, haughtiness, boastfulness, parental disobedience, invention of evil things, covenant breaking, unmercifulness, factiousness (Rom. i. 29); fornication, uncleanness, lasciviousness, idolatry, sorcery, enmity, jealousy, wrath, factious divisions, heresies, drunkenness, revellings, and such like (Gal. v. 19); passion, evil desire, anger, malice, railing, lying, eye-service (Colos. iii. 5); lovers of self, lovers of money, unthankfulness, unholiness, implacability, slander, traitors, headstrong (2 Tim. iii. 2), and many more unnecessary to cite. We are also clearly given to understand that these spiritual or soul diseases and aberrations, unchecked, may ultimately end in soul death (Ezek. xviii. 14). What that precisely means must be left to clerical minds for interpretation.

The individual human frame and its various systems, organs, tissues, and their functions likewise, have each individually and all collectively their normal action, and also tendencies to abnormal action or disease, bodily or mental; ailments, some of which, moreover, affect the structure of the part and others their functions or duties; and others, again, both of these. These bodily and mental diseases are at least over 1,000 in number. Sub-division or differentiation would increase that number considerably. Many, if not most of them, if unchecked would, and often do, end in *death*; an event which, like body birth, only occurs once in the lifetime, practically amounts to a dissolution of the earthly co-partnership of the mortal body and the immortal soul, the end of the mundane tuition of the latter, which then leaves its earthly tenement to be resolved into its original chemical elements.

To keep the human being, soul and body, in health, free from these diseases, and death, is thus a vitally important object and aim in every life. To further these all-engrossing objects certain conditions or environments are necessary: spiritual ones for soul health, moral and mental salubrity; and others physical and otherwise for the body. The study of these and how they affect the frame and the human being as a whole, although one of the most important subjects in which we may indulge, is too much neglected. The ulterior object is to keep us in life and health and working order as long as possible. To meet our requirements it is necessary to study separately three depart-

ments, which are as closely intertwined sanitarily as they are in disease; namely—

1. The Hygiene of the Soul; Spiritual, Social and Moral Hygiene.
2. The Hygiene of the Mind; Mental Hygiene.
3. The Hygiene of the Body; Corporeal Hygiene.

Personal Hygiene or individual sanitation is that which studies the health of the individual; apart from that of the community or of the nation, or race. As a rule it is the Hygiene of the body as a whole that the non-professional mind can or ought to study: that of organs, systems, tissues, and parts is too abstruse, and better left, as a rule, to the care of the physician. Much and valuable information on all of these three main departments of Hygiene is to be found in the Holy Scriptures, and much of it in its most ancient part, the Pentateuch. This it would be well for mankind to dutifully study. Because in few matters are the Creator's chief characteristics, Love, Wisdom, Power, Omniscience, Forethought, and Prescience better shewn than in legislating in personal sanitary matters for the being whose frame he formed and knows best; and likewise best knows the hygienic surroundings and environment it requires. Indeed, from a medical point of view, the Holy Scriptures may be regarded as a special sanitary handbook for humankind, to shew him the art, science, philosophy, and importance of how to keep healthy in soul, mind and body; component parts of one invaluable entity.

From experience of the race generally, and of the Hebrews in particular, Jehovah knew how little heed is usually paid, for various reasons, to the Hygiene and health of the human body by the masses, especially the uneducated; and that in spite of His constant preaching and the advice of the medical profession. And he was aware that this negligence only finds its parallel in the gross heedlessness of so many towards the health and hygiene of the soul and indifference to constant clerical reiteration of the baneful effects of soul disease or sin. In both the advice and warning of Doctors and Divines go alike unheeded.

The Deity likewise knew that a carefully regulated personal or individual hygiene is a necessary preliminary and basis of a judicious public, and that again of a wise national, and that again of a satisfactory Racial Hygiene. The Divine Sanitarian, therefore legislated accordingly, and bestowed great care on the first of these. This is obvious in all the health hints interspersed through the Bible: but is especially conspicuous in the Mosaic Code, and is practically illustrated in the numerous hygienic facts and incidents of the 40 years' Wanderings. As a complicated machine or delicate musical instrument requires constant care to keep it in working order, so the marvellous

design of that "harp of a thousand strings"—the human body, needs hourly, nay, continuous attention, especially if it is young and undeveloped, or hereditarily weak and prone to disease. Hence the necessity for personal hygiene, or the science of individual health; that is the rules or laws of living, and habits of life by which the health of individuals may be preserved or increased.

The human frame, when in perfect health, that is, with every organ intact, and every part performing its allotted function, is furnished by the Great Creative Intelligence, to whose physical and physiological works and laws we usually apply the term Creation or *Nature*, with certain remarkable endowments. One of these consists in the long recognised "*Vis Medicatrix Naturæ*" or healing power of Nature; a faculty of the utmost importance to the physician and surgeon, because it is one of their greatest therapeutic aids; the power by whose help the body repairs injuries, restores lost parts, and throws off disease. Another and most important endowment, of infinite value to the Hygieist, since without it his sanitary efforts would be materially retarded if not altogether negatived, is the *Vis Hygienica Naturæ*, or hygienic power of Nature, which consists in a remarkable vital resilience and power of resisting unsanitary influences, and repelling the numerous morbific agencies ever ready to arise from within, or to attack us from without; and capability of warding off the manifold forms of disease and death everywhere ready to assail us, no matter whether they originate in cold, heat, wet, fatigue, hunger, thirst, foul air, over eating, improper feeding and drinking, or mental depression and so on.

This curious endowment, like the former, varies with individuals; other things being equal, it is greater in the hereditarily strong than in the weak; greater in males than in females; in adults than in the very young and very old; in the inhabitants of cold, bracing climates than of those warm enervating ones. The result is, a varying amount of personal susceptibility to disease, more in some, less in others. For these phenomena we cannot account. Both of them, however, and for the facility with which the body maintains its health under the constantly and widely varying conditions of our daily life, are conditions which depend chiefly on perfect or deranged bodily functions originating in sanitary or unsanitary surroundings. But it is now recognised that it is only by the existence of these gifts, especially the first of them, that we can account for certain curious phases of disease; for example, the escape of many individuals during the prevalence of epidemics when so many succumb. It is then that the benefit of a good hereditary constitution tells. The stronger frames form a less suitable soil, and ward off the

diseases better. While the weaker ones are a more favourable nidus, and thus resist them less. Still, both of these gifts are, in all individuals, of so limited a range; and the bounds of health not only so easily overstepped, but also so difficult to regain when that result does happen, that it is manifestly our interest from every point of view to aid both objects by living hygienically, that is by taking constant care of our health; on the one hand seeking all sanitary, and on the other avoiding all unsanitary agencies.

From a hygienic point of view the human body may be compared to a citadel with a certain amount of defensive power; but surrounded by numerous untiring, active and cunning foes: and not unfrequently harbouring traitors within its own walls. Now and then an outpost is attacked with varying success, in the shape of disease: till sooner or later it completely succumbs to the great and invincible conqueror, death. The protective power, with a certain amount of which the body is endowed by its Almighty and All-wise Architect, to enable it to ward off disease, is limited. And the disease-causing agencies against which the frame has to contend, some in the body itself, and others outside it, are both numerous and powerful. Some individuals, moreover, are stronger and hardier; that is their bodies are more disease resistant than others. But as a rule very little often suffices, especially in weakly or in predisposed subjects, to make the vital machinery of the body go wrong; and fall into disease, or its more serious sequel, death. To meet this, Nature, *i.e.*, God, has also supplied us with a thinking and reasoning organ, the brain, to help us to take care not only of its own interests, but those of every other part and organ of the body; and, lastly, with a safe and ample code of health laws. By the united aid of these we are surest to maintain health. And thus guarded and guided, we have clearly no excuse for neglecting our health; and very often none for permitting disease to assail us. The hygienic indication is still more obvious and imperative. Whenever there is a hereditary tendency to any disease, then it is not only wise but incumbent on us to take unusual care of our health, with a view to avoid the special inherited ailment. Not only because this is more apt to attack individuals, but also to prove more serious in them than in others, more obstinate, tedious, and more apt to return.

Fortunately, by acting thus, vigour and long life are much more within our reach, and at our individual disposal than is commonly supposed. At the same time it is well to realize that, all through life, it is only by close attention to this that health can be uniformly preserved; and that when disease does come it is usually, if not always, by a neglect of some sanitary law or duty.

And just as every and each individual must strive to secure his own salvation and happy future destiny (Philip ii. 12), so each of us must work out the problem of his own temporal, that is physical, health and life, by strict attention to personal hygiene. Thus, those who realize the great value of these blessings will see how necessary a personal knowledge of the details of hygiene becomes. No one has the same interest in us individually that we have in ourselves, or can look after our individual concerns so closely and constantly, even if they had the necessary inclination and opportunity. Although "they that are whole need not a physician" (Luke v. 32); healthy people constantly require some advice, either their own or some other hygieists, for health preservation. There can be little doubt that the time is fast approaching when physicians will be oftener consulted regarding the prevention of disease than its cure. That family, community, or nation shews the greatest wisdom who employs the physician to point out the occult causes of disease; and thereby does what is best calculated to keep them in health by enabling them to avoid these or remove them. This result includes a saving not only of vitality, bodily strength, sickness, perhaps life, but also, and least importantly, an actual and often large pecuniary economy. This fact might be illustrated by nearly every disease under the sun; but is especially so in the two classes which, together, far more than decimate the human race, namely, hereditary and epidemic diseases. If for example, children inherit a tendency to consumption, gout, cancer, rheumatism, or disease of some special organ, it is often far better to consult a skilled adviser now, and try hard to ward off the threatened malady by unusually strict regulation of the life, and constant attention to judicious health laws; which, if they do not destroy its germs in the constitution, will certainly retard their development, lessen the attack and the danger, if they do ultimately seize their victim, and possibly preserve the individual for a good, healthy, and happy old age. So also, if an epidemic is abroad, whether of small-pox, scarlatina, typhus, or any other febrile or non febrile contagious disease, judicious advice may keep the individual and also the community to which he belongs, in good health, that is in the condition in which they best ward off threatened sickness, and if seized throws it off most easily, and suffers least from its bad results. In every case of disease, and however we may view it, prevention is better, and not only unfrequently easier to adopt than to cure.

But there are many minor, yet very important, matters about which we can consult no one, and must, therefore, rely on our own judgment and experience, often more valuable in such cases than the best counsel of others. No one, for example, can

regulate the ventilation of his bedchamber, or the amount of his diet, rest, labour, and so forth, so well as the individual himself. Besides this, medical opinion is not always at hand for emergencies, or matters of greater moment, and special cases of declining health. Moreover, most people are as unlike in their bodily requirements as in face, figure, and character. Some have personal peculiarities and idiosyncrasies, so that each is individually the best judge of the diet, exercise, sleep, clothing, and general mode of life which suits him; and knows when to modify or change them. Every man and woman should learn to be, and indeed must be, largely his own sanitarian. Hence it is necessary and wise for all not only to know but also to keep God's laws of health, *i.e.*, his statutes and commandments. For thus we may perchance avoid disease such as afflicts other peoples or nations (Ex. xv. 26) who neither know nor obey these necessary laws.

But there are other circumstances which make a knowledge of Hygiene doubly valuable. Children, unfit to judge for themselves, and old people unable to act for themselves must of necessity be hygienically cared for by others. Parents must watch over the former; for on constant and careful regulation of children's diet, exercise, rest, recreation, study, personal habits, moral discipline, and so forth, depend their present growth, as well as their future strength, health, and even length of life and usefulness. A judicious attention to psychical and physical hygiene in childhood and youth will endow such as reach adult age with vigorous frames and well-balanced minds, that is with the so much to be desired *mens sana in corpore sano*; and may even convert children afflicted with congenital or acquired bodily or mental weakness, into strong, healthy, clear-brained, right-thinking, long-lived men and women. The beginning of much disease is laid in our early years. Childhood is the "seed-time" of health. Guide the tender frames of the young judiciously. Pilot them safely past or through the disease-perils incident to this period of life, whether acquired, accidental, inflicted, or inherited. Make them strong children; and they will most likely develope into healthy adults. Like the ancient Greeks, let us look on it as a great disgrace, as it is grief to lose a child from disease.

An acquaintance with the main principles of personal hygiene is also necessary for heads of houses and large establishments in which relatives or friends dwell, and domestics or employés—"the stranger within thy gates" (Lev. xxiv. 23) work; whose health is, therefore, very little in their own hands, because their diet, cleanliness, labour, air-supply, sewerage, and so forth, are mainly or altogether under the control of a master or mistress, who cannot be constantly seeking advice, even if

this is close at hand, and must therefore exercise their own discretion, which clearly, therefore, ought to be educated in sanitary house management.

A knowledge of personal hygiene is also useful, and, indeed, indispensable for private individuals in responsible positions, as, for example, magistrates, legislators, &c.; in whose hands, as such, the health and lives of their fellow creatures are entrusted. Public sanitation is mainly based on private hygiene. A man unacquainted with the latter can neither rightly estimate the importance of the former, nor become capable of making laws, nor so convinced of their utility as to press their observance.

Nor should we ever forget that the care of our individual health is not only a matter of personal duty and individual interest, but one that involves the health, lives, welfare, and happiness of our offspring. No fact in the laws of heredity seems better established than this, that we do not only imprint on and transmit to our children our features, figure, physical peculiarities, stature, individual anatomical characteristics of race, nation and family, singularities of body, walk, gait, our capabilities and talents, ordinary and special; but also our *social* tendencies; moral character; special traits, good, bad and indifferent; unquestionably also our spiritual aspirations; also those physiological peculiarities, such as strength, vitality, longevity; as well as certain pathological idiosyncrasies, such as susceptibility to certain diseases and tendency to the development of certain ailments at certain ages. As a rule, healthy parents have healthy long-lived children. The reverse is equally true. So also we transmit our hereditary tendencies to certain diseases, such as gout, rheumatism, consumption, scrofula, cancer, insanity, perhaps the exanthemata and also inebrity. This doubly enforces it as a duty even more imperative and sacred than if we alone were interested, to make and to keep our bodies strong and free from all those transmissable afflictions that may enforce untold misery and distress on our children to many succeeding generations. This subject is distinctly outlined in the Bible, long before its inception and study in modern times, a matter of quite recent date. The discovery and specification of the keynote and basis of an important study like this, by the Bible is far more important and remarkable than its subsequent elaboration by human intellect. Nothing can be more suggestive and pregnant with deep meaning both to the enlightened physician and the student of humanity than the following scriptural quotations. "The fathers have eaten a sour grape, and the children's teeth are set on edge" (Jer. xxxi. 29). "Our fathers have sinned, and we have borne their iniquities" (Lam. v. 7; Ezek. xviii. 2; Deut. v. 9; Exod. xx. 5; xxxiv. 7; Numb. xiv. 18). "Visit the iniquity of the fathers on the

children (Exod. xx. 5; xxxiv. 7; Numb. xiv. 18; Deut. v. 9). No practical physician or surgeon of experience will contend that these passages are purely figurative, allegorical, or indicative merely of spiritual or moral results. Nor can they help endorsing the idea that they clearly point out a very important physiological and, therefore, pathological law, which they daily require to recognise in their professional deliberations, and bow to in their treatment. The same line of argument will show how neglect of ordinary health laws may influence not only the family history and welfare, but also those of the nation and the race; through the combined deterioration of the many, leading to ultimate widespread degeneracy and feebleness. And that the converse equally holds good could not be better illustrated than by the hereditary vigour, vitality and other national characteristics, derived from their selected ancestor, Abraham.

Personal hygiene, or the art and science of taking care of the body, viewed thus, becomes one of the most important of studies. And ranks next to that of religion—which includes that of taking care of its more mysterious and more precious, because immortal, tenant, the soul. Unquestionably, therefore, systematic personal obedience to the laws of health requires much and constant study, care, and self-denial. But the discipline bears a rich reward, the highest and best in life, in greater happiness, better health and vigour of body, soul, and mind; longer life, and all the numerous blessings and comforts that these involve. Hygiene is thus an art and a science, which by day and by night, and from our earliest to our very latest breath, interpenetrates every action and event of our lives. For it is well to understand that just as it is not by intermittent but by constant daily, nay hourly, attention to its obvious dictates that individuals, no matter what their rank or station in life, can keep their houses, clothing and personal property in good repair; so it is only by equal assiduity that we can reasonably expect the far more delicate, complex and perishable framework of our bodies to be kept in proper condition, and in fair working order; in other words, in full strength and health. So also, as the body is most robust when not one, but every organ is sound, and performs its functions satisfactorily: so health is best kept and life prolonged, not by systematic attention to one, but to all the rules of hygiene. Disease is apt to follow disregard of any single rule. And is all the more likely to occur if several are simultaneously broken. For example, a person who is careful of his diet, but inattentive to personal cleanliness of body or morals, rest, recreation, &c., cannot expect to enjoy the most vigorous health. Nor can those who attend to physical hygiene, but neglect the rules necessary for their mental and moral guidance, with which the former is so closely

connected. Keep body and mind pure, properly fed, well exercised, duly recreated, and rested. Keep every part and function adjusted to every other part, accepting Nature's constant and marvellous help therein. Keep the will and the conscience under proper control; and health is most likely to be maintained. The reverse holds equally good. As the highest health is attained and kept by a close observance not of one only, but of all of these laws of hygiene; so is it lost by their non-observance singly or conjointly. There are special and distinct diseases produced by the infraction of every one of them. Thus many ailments are caused by faulty, deficient, or excessive dieting. Many others by impure water. Others again, of a different kind, by unhealthy air. Others by over or defective exercise or work. Others by too little sleep. Of all of these a list might be superadded, and almost infinitely extended, till it included, directly and indirectly, almost every known malady. But it will be better to specially mention the many ailments that follow a persistent disregard of hygiene, under the head of separate topics. When all or several of the laws of hygiene are *persistently* broken, disease is, other things being equal, more certain, severe, and lasting. For instance, if a student or a sempstress neglects their diet, breathes confined air, takes too little sleep, overworks the body or the brain, neglects cleanliness, exercise, &c., and especially if they are guilty on all of these counts, various diseases, especially of the scrofulous type, are apt to ensue. Or if a fashionable lady or gentleman persistently interferes with the routine necessary for health; turns night into day, curtails sleep, breathes the tainted air of crowded assemblies and ill-ventilated bedrooms too often or too long; while they, at the same time, neglect their food, over excite their nervous and muscular systems, the body, sooner or later, becomes worn, emaciated, and a ready prey to disease. And other examples might be given, if necessary. Thus it will be apparent that the highest and most uninterrupted health is most likely both to be attained and maintained by a constant daily, nay, hourly, course of self-denial, and attention to the minutiæ of hygiene in all their details. By study, this becomes easy; while its important results render it both pleasant and profitable. The reward, success in our efforts, amply repays the outlay.

It is unquestionably mainly to differences in their hygienic surrounding that is due the different amount of sickness and mortality among the different classes of the community. Sanitary differences arising usually from ignorance of the subject; even among the fairly or well educated: but also often from sheer indifference or carelessness. Thus, the poor have more sickness and deaths, because far more often underfed or badly

fed, imperfectly clothed, dirty in their persons and houses, than the middle and upper classes. So also their children sicken and die in far greater proportion, from the same causes, especially cold and imperfect feeding. Again, working men suffer more than those who do not require to soil their hands; by reason of overcrowding and resulting impure air, overwork, deficient open-air recreation, &c. But, on the other hand, the wealthier classes have their special diseases, arising from the impure air of over-crowded and super-heated room, irregularities in dieting, excesses of various kinds, imprudently defective clothing.

Nor are these hygienic errors in our life history and health record confined to any age, race or class of the community, or to any condition in life. Nor are they even confined to barbarous tribes, or to the uneducated among civilized nations. For in this our so-called thorough education too often neglects this most important subject. The errors are universal. And the most cultivated are often those who most frequently shew the least knowledge of and regard for hygienic observances, and trade on their inherent stock of strength and health. But these faults and their results are not entirely alike in every grade of the human family. Thus, savage and semi-civilized races often err in every one of the recognised sanitary requirements of health. Hence their comparatively brief lives, and frequent ailments, which not unusually kill them off wholesale: so that it is only their healthy outdoor life which keeps those races from speedy extinction, by counteracting the other insanitary agencies which surround and interpenetrate their daily life. So also among civilized races, like our own, the chief unhygienic influences to which the poorer classes are subjected, are overcrowding, impure air, scanty and faulty food, overwork, deficient recreation, defective water supply, uncleanly habits, bad drainage, unhealthy trades. Again, the upper classes suffer from late hours, impure air, deficient sleep, errors in dieting, chiefly those of excess in food and drink; various excesses prevalent among the idle. The middle classes, again, suffer from errors which are included in both of the above categories, according as they incline towards either grade of the social scale and the ways, customs and mode of life of the community. So also dwellers in towns suffer more than the urban population, because the latter have purer air, though often smaller houses and indifferent ventilation, and healthier outdoor occupation. Indeed, it is the latter, viz., the purest of all air, which is the chief sanitary agent with farm and outdoor labourers, as it is with soldiers and sailors, to more than counteract the unhealthy influence of the many other unsanitary influences to which they are subjected, and make them as healthy as we find them, and as long lived.

Both the upper classes and the masses thus suffer individually and collectively from various, though very different, unhygienic influences, which make both more sickly and shorter lived than they otherwise would be. Still, taking them for all in all, the poorer classes undergo most, for obvious reasons; namely, because their unhygienic surroundings are not only more numerous and serious, but their hygienic ones also, less numerous and less prolonged than those of the higher classes. So that they are more frequently and more deeply afflicted with disease, and live shorter lives, as a rule; a fact which might be easily proved by statistics, both among the urban and the rural parts of the community.

There are thus many cogent reasons, private, public, social, moral, spiritual, and otherwise, why individuals should attend to their health. And with this object in view, make a personal study of hygiene. These may be briefly summarized as follows:

1. We thus learn to avoid many dangerous unsanitary excesses of different kinds; and bad habits, physical, mental and moral; all apt to induce disease, and prove detrimental to health.
2. We are also enabled to avoid or lessen many dangers which may lurk in our daily routine or calling, apt to be dangerous to health and life.
3. We thereby learn what is the best routine in dieting, sleeping, exercise, &c., which is best calculated to perfect and to preserve the physique, health, strength and life.
4. We learn so to order the hygienic rules of our life as to be able to strengthen our individual weak organs and parts, or their functions, and thereby to better preserve our strength, health and life.
5. We may, by a judicious mode of living, advantageously increase our personal strength; thus favouring the condition in which we are least likely to be attacked by disease; and are most able to successfully battle it when it does come; and throw it off soonest.
6. We render ourselves safest during epidemics: when it is usually the weakly who succumb first and die in greatest numbers.
7. As a rule the healthier we make ourselves so much the happier are we; and vice versa.
8. The health of our children, friends, neighbours, depends in no small measure on our own salubrity; especially during epidemics. To increase the one is to augment the other; and vice versa. Thereby making hygiene a duty towards others; a civil, national and racial duty.

9. Health preservation is clearly a duty to ourselves.
10. It is still more a duty towards God, to obey His laws, and preserve the health and the life-talent He has bestowed.
11. Ill-health and sickness imply and involve loss of time, expense, interruption in study or business, worry, pain. To reduce or remove the former by judicious personal hygiene is to lessen the latter.

Individual healthiness is thus both attained and maintained not by intermittent and fitful, but by continued and persistent self-denial. By resisting tempting self-indulgences of various kinds, most of which need to be resisted owing to their seductiveness; and that not during any one period or season; but all through life. And by constant attention to different unsanitary bodily habits; some of which are stronger at one period and others at other periods of life.

It follows that, as a rule, other things being equal, the sickness and death which occur in a family or in a community are chiefly among those who pay least attention to personal hygiene in its different branches, or in all its details. Or, to put in different words, what amounts to the same thing; the individuals who are the healthiest and have least sickness are those who pay most attention to personal sanitary measures. Health and life have much to contend against at certain periods. And it is manifestly our individual duty as well as interest to endeavour to help not only ourselves, but also each other, through as many of the different stages of life as easily, as safely, and with as little pain and disturbance as possible; to husband our vital forces, and protect ourselves from accidental diseases as much as we can, ere our stock of strength fail. Lessened vitality soon follows a departure from any one of the hygienic laws of life, and especially some of them. The natural elasticity of the constitution is soon exhausted. Nature rigorously exacts the penalty, and disease follows.

Moreover, *personal*, and what may be termed *home* hygiene, including mainly an abundance of proper food, pure water and air, cleanliness, and other simple sanitary items appertaining to the dwelling and those who inhabit it, is of even more importance than public sanitation, towards preserving the health and lives of individuals, families, and the masses. Indeed, communal health is merely the sum total of individual health.

Statistics shew that wherever sickness and death are most prevalent, it is among the children and the adults who pay least attention to hygienic precautions. Among those who live in unclean houses, have unwashed skins; forget to ventilate their dwellings; those who are inactive and lazy, or underfed, poorly clad, intemperate, immoral; and who thus, either from poverty,

indifference, ignorance, or viciousness, court disease in its manifold forms. So, on the other hand, statistics prove that disease and death are least active among those who realize the importance of sanitary matters, and take constant prudent care of their bodies and their health.

The reason will be obvious why the morbidity and mortality are greatest among the poor than among the rich: and especially among their children, who succumb easiest to unsanitary influences. How wonderfully the child death-rate is influenced by social position and by the greater care taken by the upper classes, is shewn by the following facts:—

	Alive at the end of 5th year.			
	Among the Peerage.	Among the Upper Classes.	In all England.	In a poor city street.
Of 100,000 children born alive - -	90,000	87,000	74,000	10,000
Percentage of deaths	10	13	26	90

Thus, of a hundred thousand children born in each of four grades of society, while ten thousand had died before attaining the fifth year of age among the aristocracy: thirteen thousand had died among the upper classes: whereas among rich and poor alike, the number had risen to twenty-six thousand: and among the very poorest and most neglected it reached the appalling figure of ninety thousand; or nine times the amount among the peerage. No better proof could be had of the advantage of personal hygiene in preserving health and life, especially among children.

The Bible gives many valuable hints regarding every one of these, the most important objects of personal hygiene, and is, in fact, a great storehouse of information regarding food, drink, air, clothing, rest, exercise, cleanliness, mental, moral, and spiritual culture and so forth.

These different hygienic subjects, strict attention to which tends most to preserve health, must be studied in turn. Because it is mainly by neglect of these, singly and collectively, that health becomes impaired, disease induced, and death courted. All of the hygienic factors now spoken of have often to be varied, and regulated in their application, because of certain minor disturbing causes, which render it impossible to make

sanitary laws strictly inviolate and often necessitate their modification for special cases. For example:—

1st. The physiology of the human body is different at different epochs of life. Hence the food, clothing, and other hygienic necessities require to be modelled for infancy, youth, adult and old age. And since not only the physiological conformation of the body and its different organs and tissues, but also their health and vitality differ materially during these different phases of the human career; as also does its exposure to the ordinary disease-causing agencies; it follows that the hygienic rules necessary for these different periods rarely wholly coincide. Those necessary for the helpless infant differ considerably from those for the active, growing boy or girl; these again from those for the busy, full-grown adult; and these again from those for the weak old man or woman. Hence this forms a special department or division of hygiene; which can merely be pointed out, but not entered into. In connection with this, however, it is necessary to know that normal, healthy life has been artificially divided into the following different stages:—

a	Childhood, including the period of early growth and the first dentition, extending from birth to the		7th year
b	Adolescence, beginning at period of second dentition	7	„ to 14
c	Puberty—period of evolution	14	„ 20
d	Adult age—prime of life	20	„ 30
e	Maturity—maximum of weight, solidarity and endurance	30	„ 45
f	Turning-time—grand climacteric or middle age	45	„ 60
g	Advanced life—decline of life	60	„ 82
h	Old age	82	„ 100

2. So, for various reasons, the hygiene of the *sexes* varies somewhat.

3. For obvious reasons the hygiene of different *trades*, occupations, and professions, is another special and most important sub-division.

4. Civilization, likewise, makes the hygiene of savage, semi-barbaric and civilized individuals and races to vary considerably: thereby forming *racial* hygiene.

5. So also the geographical position of places and peoples, furnish another department of the hygiene of *climate*, *season* and weather changes; since these necessitate material and frequent modifications in the food, cloth-

ing, warming, ventilation, exercise; to correspond with and judiciously meet constantly veering, changing, meteorological conditions.

It is impossible here, however, and foreign to our present purpose to enter here into the full study of these minutiæ, except to point out where they are spoken of in the Bible.

The Hygiene of the *Home* is another important branch, and may be considered a part of personal hygiene; worthy of study in detail. Moreover, various circumstances combine to make a daily increasing necessity for a closer attention to hygiene, both personal and communal. These are:—

1. Certain demoralizing conditions of modern civilization.
2. The fast rate at which most people are forced to live, owing to competition.
3. The wearing anxieties of business.
4. The increasing aggregation of human beings and concentration of unhygienic conditions.

The Holy Scriptures, from beginning to end, give many illustrations of the loss of health and life and the occurrence of disease by individuals and communities breaking Heaven's laws, sanitary, social, moral, spiritual, and otherwise. We need go no further than the Pentateuch and the highly instructive, educational, and pointed history of the Hebrews of the Wanderings that illustrates so many hygienic truths, and not a few of those adduced in the previous pages. Diseases of the Body were to be sent among the Israelites of the Exodus as punishments for breaking God's laws and were to be avoided by keeping them. The following are, moreover, enumerated among the bodily diseases threatened. They might arise solely as punishments for neglect of the sanitary laws of Nature, which are as much God's commands as the physical ones. Or they might spring from that, combined with neglect of His spiritual, moral and social laws. Neglect of the latter alone would not suffice, without disregard of the sanitary laws. The ailments mentioned include: Pestilence or plague, a frequent, ravaging and much-dreaded Eastern scourge (Deut. xxviii. 21 and 59); consumption or wasting (Deut. xxviii. 22); fever, inflammation, extreme burning (Deut. xxviii. 22); botch of Egypt; emerods; scab; itch; madness; blindness; all the diseases of Egypt (Deut. xxviii. 27, 29, 34, 36, 60); *every sickness* and every plague not written in the Book of the Law (Deut. xxviii. 61); mental, moral and social fear, depression, and sorrow (Deut. xxviii. 66); hunger, burning fever (Deut. xxxii. 24).

In addition to these examples many other parts of scripture, and especially the Psalms, will be found full of similar allusions to God's power over health, life and sickness; Man's personal duty and care regarding these; and the mode and means of

effecting this, viz., by keeping Jehovah's statutes, laws and commandments; and, above all, by acting up to His all-potent sanitary maxims (Is. 51. 7).

It must be obvious, as a most important point in private hygiene, that, in addition to our universal and Divine Maker, there is only one other being who can be hourly and daily looking after our individual health; and ever critically watching the many factors that influence it for good or for evil. That being is the individual himself. Doctors, friends, relatives, and in a sense not even the Deity will suffice: inasmuch as the latter bestows our health, life and frame as talents or gifts for us to care for, and leaves them much in our own care, as free agents, to treat them as we will. And also punishes our neglect, or rewards our wise efforts to keep that which is really God's property and not ours, in proper repair and health. In this matter personal efforts must take the initiative of the Divine aid in all our hygienic efforts, if we would have the Supreme to help and bless our own work. Nor need we ever ask His hygienic aid without this. God helps those who help themselves, and these only as a rule.

Health and disease are much more controlled and regulated by the laws of Nature, than is generally known to the mass of Mankind. Fortunately, these sanitary and morbific laws are largely, nay, mainly, under human control. And so well are these laws known and studied that any physician might plan rules of conduct, or dieting, drinking, &c., &c., by the combined influence of which any individual, however strong, who strictly followed them, could sooner or later develope almost any disease known; e.g., scrofula, phthisis, rheumatism, gout, dyspepsia and so forth. Indeed it is by unwittingly following this course in our daily life, and too often by knowingly doing so that unwise individuals bring disease upon themselves. The reverse likewise holds good. For, on the other hand, it is simply by avoiding the morbific agencies now alluded to, persistently and wholly; and thus alone, that we can ward off disease and keep our bodies healthy, either in our individual or our communal capacity. Thus, though human life and health are both in God's keeping, it is equally obvious that we may oppose his wise and beneficent efforts to preserve or restore these inestimable twin boons by our own sanitary unwisdom. So that in another sense it is well to remember that our health and life are also largely in our own hands.

How dependent Mankind thus are, and how little cause they have for conceit or pride, either individual or racial will therefore be apparent from our sanitary dependence on Jehovah, as well as for everything we are and for all we have. Our soul and body, our earthly abode, our health and life,, the laws and

forces that sustain these, not the least important of which are the sanitary laws of humanity and nature. Our human weakness is apparent at all ages, but is especially emphasized by the fact that our birth and our death, our entrance into and our exit from this mortal state, are both marked by physical pollutions and necessity for sanitary purification. Birth and death are thus connected with pollution, sin, and defilement. The pool of human corruption is stirred anew by whatever passed into or out of it. Nay, even married life entails frequent uncleanness and necessity for purification.

When the public studies sanitary matters it is well to remember that, although the human body is, in one sense, the same entity all through life, in another sense it is very different. Thus the infant is very different from the aged, not only in size, but also in delicacy, form, and many other respects. It requires different food and other treatment, So also its hygiene is different. This fact causes a certain marked difference in the hygiene of each of the following different periods of life.

Periods of Human Age

1st. The nursing age or infancy from birth to the 7th or 10th month.
2nd. Childhood, from the 1st to the 2nd dentition.
3rd. Boyhood, from 2nd dentition to puberty.
4th. Adolesence, from puberty to the 20th or 25th year.
5th. Early Manhood, from the 25th to the 45th year .
6th. Late ditto, from the 45th to the 60th year.
7th. Old age, from 60 years onwards.

The basis of all hygiene consists in this, that from birth to death our human health and life depend on two factors. These are, *first*, heredity; *i.e.*, our original inheritance of vitality from our parents and ancestors: and, *second*, the external conditions to which our bodies are exposed after birth, and necessary to carry us through life, such as air, food, drink, light, temperature, exercise of mind and body, sleep, rest &c. The highest health and the longest is likely to be maintained when our inherited vitality is of the best and the after conditions of the most satisfactory nature; and vice versa. And, clearly, it is when our hereditary tendencies are inferior, it is necessary to make our subsequent attention to hygiene as perfect as possible.

According to the same law of heredity, the life and the health and life of some individuals are naturally better and stronger than others. Their inherited store of vitality and of life, upon which they can draw in emergencies is greater. This is unquestionably one and a main reason why some persons live

longer than others; have fewer ailments; and do not so readily succumb to certain unsanitary agencies, when others easily and seriously suffer therefrom.

It is also well to remember that another important reason why we should endeavour to keep our general health constantly at par is, because disease, whether acute, sub-acute, or chronic, invariably or generally attacks the human frame when the general or local health, one or both, is below the normal standard. Our universal and cunning foe, disease, usually pounces on the weakly, in preference to the strong and the healthy; the young and the old in preference to the middle-aged.

How much more continuously healthy we should all be; and how much sickness and pain we should all avoid; and how much longer we should all live; if we individually followed closely and constantly the various precepts of hygiene found in the Bible; it would be impossible to estimate. Disease would be much rarer than it now is; the world would be healthier. Our ailments would be much shorter than they now are, when they did find an entrance; Man would live to a greater age; would be stronger, possess higher vitality, and be correspondingly happier if more free than he now is from the worries, direct and indirect, that sickness induces.

As with our spiritual and moral, so is it with our physical hygiene; it is not the greater but the lesser sins of omission and commission that mankind has chiefly to guard and contend against. We have oftener to avoid those frequent, small, insidious, and alluring transgressions against the laws of health that so bestud our path: those errors in dieting and other indulgencies of various kinds that do not perhaps perceptibly or seriously affect us at the time, but by their slowly and surely cumulative effect in undermining the vital forces and health either of individual organs or the entire body, local or general; thereby, sooner or later, combine to induce disease in one form or another.

The Mosaic Hygiene of Health, that is its physiological hygiene, which includes the study of special sanitary agents or factors, is divided according to the table into, 1st, private, individual, or personal; and, 2nd, public, that relating to the community; national or state medicine, that affecting the nation; and racial, that involving Man as a race. It thus includes many laws regarding the objects and occurrences of our personal daily life, that more or less materially influence health, and that often enter very minutely therein, according to their importance. Thus it gives plain rules regarding the Hebrew dieting, drink, air, exercise, rest, cleanliness, marriage, heredity, mental, moral and spiritual hygiene, and is especially

minute regarding food and cleanliness. It scarcely requires the medical instinct and professional training to recognise the very great and commanding importance of these prominent sanitary agents to mankind generally as well as to the Israelites; especially when found in a book which we revere and consult; and when given for our own special benefit by the Being we ought to love and serve as our Maker, Preserver and best Friend.

For many reasons it was especially necessary to teach the Hebrews of the Exodus and the Wanderings the rudiments of Hygiene, especially that which is personal.

1. Because Hygiene, even elementary sanitation, was practically unknown then. Its rules, laws, and advantages had not yet taken shape in the comparatively crude medical minds of that day. The sanitary code delivered at Sinai must have been a surprise and a revelation, and welcome even to the medically-educated Moses. But, with wise professional acumen, combined with Godly love for its Author he would at once appreciate, receive and enforce it. But not so the people; more obtuse, less Godly, and more unwise, even regarding their own individual interests. And, unless its enactments, especially the repeated ablutions and isolations, &c., ordained with a view to disease prevention, had been strictly enforced, they would doubtless have often been evaded or minimized, and at last altogether neglected: then as they are now. The Great Father knows His children's weaknesses; and He legislates accordingly. Human Nature among the masses then was very much what it is now. Obstinacy and self-will prevail. He thus enforced excessive cleanliness, the basis of all sanitation: knowing that as a rule the ignorant and the debased are the least cleanly, and therefore most require compulsion. Then, as now, individual hygiene was mainly in each person's own hands. And thus personal knowledge was necessary regarding its laws. And especially incumbent on the Priests and the Levites; men who had both to learn the sanitary code, teach, and also obey it.
2. Another reason was, that the majority of the Hebrews of the Exodus were doubtless very ignorant on most subjects; and altogether so regarding sanitary matters, as that was not then a recognised study. The minority, including the better class, not only possessed the national shrewd intelligence, but were doubtless fairly educated. But the majority, including those

who had been makers of bricks, canals, and buildings, were so degenerate, degraded, and disheartened, as to have no time or thought, even for general education. And then, as now, it is mainly among this careless and unlettered class that hygienic teaching and sanitation, especially its most important factor, cleanliness, finds least favour; and is most apt to be strenuously opposed or altogether neglected. They had, therefore, to be educated up to it; and thus led by degrees to see its importance. At first they had to be taught its elements; and their intrinsic value and bearings; not by intellectual education alone, but largely by compulsory enforcement of its sanitary rules, very much as we educate children in subjects in which they have little or no interest, or for which they have a natural dislike and would fain avoid when they possibly can. The Hebrews of a later stage of the Wanderings, the second generation, taught by the Priests and Levites, and accustomed from childhood to see sanitation practised and enforced in tent, street, camp, tabernacle and home, had no doubt reached a higher educational plane, and were better versed both in general and in sanitary subjects, inculcated by the Laws of Sinai. But even then, as now, hygienic teaching requires constant reiteration and enforcement to be successfully indoctrinated, and fully implanted in the ordinary human mind.

3. The Hebrews were meant to be privately and individually, as well as nationally, a model people. It was therefore necessary to educate them in social and household and public as well as in personal hygiene. Especially the Hebrews of the Exodus; those who heard and first followed the Sinaitic Sanitary Code; were then meant to aid the more law-learned Priests and Levites in teaching the sanitary code to the multitude, and the rising generation that was at one time destined to be ultimately privileged to enter and occupy Canaan as a well-developed and steady nation.
4. The rudiments of personal hygiene is the basis of public sanitation. To teach the masses personal and household hygiene was the surest mode to shew the necessity for strictly carrying out the other laws laid down for public sanitation; and to make these a matter of national import.
5. The basis of all sanitation, personal, public, national, and racial, is cleanliness. It was in this that the Divine instructor chiefly indoctrinated the Hebrews

individually by frequent cleansings of the body, clothing and household utensils; and by interpenetrating many, and these some of the most frequent events of every man and woman's private life, thereby instilling hygienic habits by reiteration and repetition; which, like all other kinds of knowledge, may be first disliked or despised by the learner; then unwittingly acquiesced in; and finally appreciated, embraced and followed, because better understood.

6. The Hebrews had left the open healthy plains of Goshen, and were now massed together in tent and camp. In other words, the chance of having a less sanitary environment was materially increased. Thus it became especially necessary that every human unit in the Hebrew community should be personally interested in and should aid the general sanitary welfare, and, that, while studying zealously to preserve his own health, should also realize that he was thereby aiding and promoting the hygienic welfare of his neighbours, his tribe, and also the entire camp.

2. Biblical Hygiene

But in no department of Scriptural lore is the depth and philosophical tendency of the Bible texts and allusions bearing on the subject of medicine better shewn than in those which consist in the practical application of physiology to the well-being of Man, which constitutes the science of health preservation, or, in other words—disease prevention. Disease, the time, mode and cause of the introduction of which has already been discussed, may be dealt with in one of two very different, distinct, and opposite methods; which we often have the option and privilege of choosing. We may either try to *cure*, or we may endeavour to *prevent* it. These two subjects constitute the great twin branches into which the art and science of healing is divided: the latter being unquestionably the highest branch of the noblest of all the arts and sciences—namely medicine. It will be subsequently seen that it may be gleaned from the Bible, and from that book alone, which gives the earliest authentic medical history, that in the very earliest ages of mankind they were only privileged to enjoy the first of these two, the first devised mode, and then the main and indeed sole aim of medicine. And that it was not till the time of the Exodus that the second plan was introduced, by which sickness is anticipated and avoided by judicious bodily management; a plan which obviously possesses infinitely greater advantages; and the promulgation of which to Man was one, and that not

one of the least of the wide-reaching and far-seeing benefits and innovations bequeathed to Man by Moses.

The art and science of hygiene in their broadest sense comprise whatever aids and perfects the growth of the different organs of the human frame, preserves and increases its health, keeps it in condition, augments its vigour, and prolongs its existence. It embraces laws that aim at the most perfect culture and prolonged vitality of mind and body; and also includes the various methods of lessening and repelling disease and death; and renders curative proceedings unnecessary. Hygiene tells us how to keep healthy, not by continually or even frequently taking medicine; but by avoiding it, and even the necessity for it, by careful and systematic personal measures, by which the person becomes a strong individual and not a valetudinarian. Hygiene thus comprises two great objects—namely, *first*, to keep the body so healthy as to enable it to exercise its inherent power of warding off disease by its Vis Hygienica. In this sense hygiene consists of practically applied physiology, that is health preservation: and, *second*, to remove the causes of disease likely to attack the body. From this point of view, hygiene is applied Etiology, or disease prevention. As the object of both is identical, and one cannot fail to help the other, the two ought to go hand in hand to give the best chance of immunity from disease and the maintenance of the most perfect health. In the combined form they constitute the philosophy of medicine. And both are based on an accurate knowledge of what comprises true health, and the thorough identification of disease.

The curative branch of medicine has been practised from time immemorial. But the other, namely the hygienic method, was only slightly written on and only to a certain extent practised, from the earliest ages; notwithstanding all that Moses had written on the subject some hundreds of years before the earliest of our non-Biblical medical philosophy. Health preservation has thus all through the ages been much neglected till later times; and, indeed, had scarcely a place in medical literature till the philosophical period which commenced about B.C. 500. Then, however, as has already been pointed out, its importance began to be recognised. But it was long till it acquired a satisfactory basis; the therapeutic mode of dealing with disease being retained till almost yesterday. Nor was it till modern days, and especially the last fifty or even thirty years that it has received anything like adequate attention, and become developed into a connected system and far-reaching and all-important study to which all modern medicine tends. Medicine is unquestionably becoming more hygienic day by day. And the most valuable and lasting medical advances of

recent times are those made with a hygienic object. The Sanitary is thus fast taking the lead of the therapeutic branch of medicine; the place to which its greater importance naturally entitles it. Its practical worth is popularly attested in this present utilitarian age by the well-known and oft-quoted, though still in our far oftener more theoretical than practical wisdom, too seldom followed, proverb, "prevention is better than cure"; an adage even more true of medical than it is of other matters. Progressive enlightenment is thus at last wisely adopting the ancient belief and precepts of the Holy Scriptures. We are now only beginning to apply to disease the principles which Moses revealed to mankind more than three thousand years ago. This, the latest and to us the most important addition to the circle of the sciences, has got much to learn from the most ancient of histories—the Bible. And the nearer we bring our sanitary regulations to those delivered by God to the Children of Israel, the more perfectly will both individual and national health be preserved. Even the latest hygienic handbooks are all anticipated by the Hebrew sage, as were the earliest.

Even when disease comes as a heaven-decreed punishment or for some other object, our health and life are, in a large sense, in our own hands. And we might easily escape these sad effects simply by avoiding the cause. The result will be the same, no matter what may be the individual's character or station in life. Nor does it matter whether he is young or old, rich or poor, dull or clever, ignorant or learned, lowly born or noble, despised or respected. The same result happeneth to all (Eccles ii. 14); and may be similarly escaped. But altogether apart from this, health and life are unquestionably, in another sense, still oftener and to a greater extent in our individual control: and may either be *preserved* by following or *lost* by neglecting the ordinary and simple laws of health. Neither can we always, and indeed but comparatively seldom, regard sickness and mortality, whether it be public or private, as scourges or as direct punishments for sin, except it be for the scarcely less aggravated indirect transgression of a neglected rule of hygienic conduct; the consequent withdrawal of the Divine protection and support, and its dire and unfailing consequences. The great Creator of all things governs and maintains the universe according to certain comprehensive, all-wise, and all pervading rules or laws. That Creation being a dual one, these laws consist of those of the spirit world, of which we, doubtless for a wise reason, know comparatively little; and those of matter. The latter are likewise twofold, and consist of those physical laws which influence the inorganic or lifeless world of matter; and the vital or physiological laws which sway the organic or animal and vegetable worlds, endowed with

life. The latter, or vital laws, embrace three others of great medical interest, viz., the laws of life or vitality; those of health or hygiene; and their antithesis, those of disease or morbidity, and of death or mortality.

These laws, one and all, are inflexible, unbending, and immutable. And just as when the physical laws of creation are broken, physical aberrations or disasters of one kind or another are sure to follow: so when the physiological laws of life are broken, the issue is likely to end in loss of health, that is, disease; or the loss of life, that is death. The health laws which govern living forms are apparently not quite so rigid as those physical laws which govern inert matter. But this is only because the vital machinery of living bodies, animal and vegetable, and especially that of the human frame, is to a certain extent self-repairing, and does not soon or very much shew the physiological results of broken health laws. It is therefore not only our duty, as will be presently seen, but also our interest to individually and collectively study and observe, with a view to avoid interfering with these laws of life, and more especially the laws of health or hygiene; thereby to prevent the bodily disasters that are sure to follow; and not to oppose, but rather to aid them, thereby to use our best endeavour to pass through this world with as little sickness as possible, live as long as we can, enjoy as much and as long life as is permitted, and transmit these invaluable inheritances unimpaired to our offspring, the best legacy it is in our power to bestow. These considerations make the question of health not one of trivial import, but one of great and solemn moment, nay often one of life or death both to ourselves and our children.

Moreover, the highest medical testimony here steps in to our aid and tells us that, though we cannot doubt that disease and death are in every case Heaven-permitted, neither of them is, for the most part, God-sent, but purely self-inflicted. Nay, if it were possible to obtain statistics it might be shewn that the great majority of diseases are thus self-caused; and that in the vast majority, and perhaps almost every case, we have ourselves directly or indirectly to thank for inviting, making, fostering and propagating and spreading the ailments that afflict us. In brief, it may therefore be said that we make court for and intensify our diseases by our own imprudence, unwisdom, and want of self-denial, in neglecting the most obvious requirements of hygiene.

Therefore, both figuratively and practically, we hold our health and life in our own hands; each to do with them as we will; to hold or to loose them, as we choose. As with our soul's eternal salvation (Phil. ii. 12), so with our worldly health welfare, each individual must work the problem out mainly for himself. The issue is mainly in our hands; and the birthright and

privilege inalienable. We are taught that we must take care of our private property, our houses, land, clothing and furniture, and we act accordingly. But regarding what is of infinitely greater value, from every point of view, namely our health and lives, we too often neither know nor care. And we thus treat our bodies as if they can bear any kind of abuse and neglect; and act as if the delicate machinery of our frame could stand any usage, needed neither care nor repair, and is fated to go on working thus for ever. That it is at least as necessary, and indeed more needful, to take care of our bodies and our health and life as it is to look after our personal belongings, is one of the great lessons of life that every individual must sooner or later learn; and sometimes fortunately learns early in life; sometimes not till well on in years; and, unfortunately, too often comes, both to old and young, too late to be of any avail, because shattered health or an early grave gives them no second opportunity to shew they have profited by the lesson.

So that in the great majority of cases, as will be subsequently seen, instead of the Supreme Being, or as we often say, Providence, we have only ourselves, or our friends, neighbours, magistrates, rulers, and Government authorities to blame for this wanton mischievous and ignorant injury to our own flesh and blood. Disease and death are the retribution for neglected hygiene, slighted obedience to Heaven's decrees, and indifference to Nature's health laws. The fullest health and the longest life are the result, on the contrary, of the reverse of this, strict obedience to the hygienic code. All sanitarians are fully agreed on this point, namely, that the waste of health and sacrifice of human life thereby originating in communities and nations have been, and still are, enormous. Also, that these are due to removable and often easily preventible causes. And that they arise solely or mainly from a persistent and culpable neglect of the ordinary, usually simple and easily followed, rules of private and public hygiene: this negligence arising sometimes from pure ignorance, but often also from indifference or selfishness. Thus, there are clearly two great hygienic duties incumbent on every living being. The first is, to learn that it is absolutely necessary and incumbent on us to take care of our bodies, its health, strength and life: and, second, to find out how to do this. As will be easily understood, the hygienic, like all other knowledge we ourselves seek for and think out, is more appreciated and valued than such as we have from others.

Our health, life and our happiness thus depend much on a personal and intimate knowledge of science, especially sanitary science. And the question has been thus very appositely put "whether if it were perfectly certain that the life and fortune of every one of us would one day depend on our winning a game

of chess, we should not all learn something of the game. Yet it is a very plain truth that the life and fortune of every one of us depend on our knowing something of the rules of a game infinitely more difficult. It is a game which has been played for untold ages; every man and woman of us being one of the two players. The chess board is the world; the pieces are the phenomena of the universe; the rules of the game are what we call the laws of nature. The player on the other side is hidden from us. We know that his play is always fair—just—and patient. But we also know, to our cost, that he never overlooks a mistake, or makes the smallest allowance for ignorance. To the man who plays well, the highest stakes are paid with overflowing generosity; but one who plays ill is checkmated, without haste but without remorse.

Health and life, disease and death are thus clearly removable from the realm of fate—chance, luck, nature, circumstances over which we say we have no control, the anger of the gods, and, in a limited sense, from that of Divine interference. Devised and established by the same Supreme and All-wise Intelligence, the physiological and hygienic laws that prevail on this Earth are as well defined as the physical ones which emanated and are continued and controlled by the same great original. In other words, those agencies which keep the body in health are as clear and concise in their action and aim as are those which sustain the universe, and govern the manifold operations of Nature; for example, the laws of gravity, or those of heat, light, electricity and magnetism. And just as aberrations in the laws of matter cause the varied convulsions that we term storms of wind or rain, lightning, thunder, earthquake, and such like physical manifestations: so when we break the laws of health, we induce the different phenomena in the human frame to which we apply the general term, disease. Nature punishes every slight; and revenges her own wrongs by disease storms.

In evidence of this, and with a view to dispel several very prevalent popular fallacies regarding disease, especially as to its source and prevention; it will be judicious to illustrate these fundamental truths by a few examples of what occurs in every day life; and events in and by which indeed most of the sickness and the deaths that happen in all periods, at all ages, and in every clime, race and rank in life, have their origin.

Thus if—with a view to shew the figure to advantage, or from any other motive an individual goes about underclad indoors or in the open air, and thereby induces a "chill," which again culminates in the form of inflammatory rheumatism or one of the many and often dangerous varieties of "cold," either in the head, throat, lungs, or some other important internal organ, who is to blame for the result? Can anyone justly

blame God or Providence for the result, or say it arose from fate, luck or chance? Or, again, if the same thing, and for the same reason, happened by suddenly leaving a heated room, house, ball-room, church, lecture hall, or crowded assembly, without taking the precaution to add wraps enough to protect from the chilly external air, by which pneumonia, pleurisy, bronchitis, cynanche, diarrhœa, dysentery, enteritis, peritonitis, or some of the many serious and perhaps fatal forms of internal inflammation may spring, whose is the fault? Or if we deliberately overload the stomach by a sumptuous—hearty—or ill-timed repast, and thereby become dyspeptic, bilious, head-achy; or by persistence therein, contract some gastro-intestinal ailment, perhaps the most numerous and troublesome class of diseases which afflict the human race, on whose shoulders ought we to lay the blame? Or, again, if a fond but unwise mother permits or coaxes a wayward but irresponsible child to surfeit itself with indigestible or hurtful kinds of food and drink, such as sweetmeats, nuts, cakes, wines, and thereby induces some of the numerous and severe ailments peculiar to children, who should be held responsible for the result? Is Providence to blame? Or if an unwise young lady stints her food with a view to produce pale cheeks and a slender form; or drinks vinegar and various other hurtful fluids in order to make herself thinner than Nature intends her to be; and by such means impairs her health, and perhaps induces some serious disease, who is to blame for the effect?

Or if, by the prolonged use of an erroneous though perhaps favourite dietary, we contract chronic rheumatism, gout, or some of the so-called blood diseases, a numerous class; at whose door should we lay the sad sequel? Or if anyone persistently drinks intoxicating liquors to excess, and thereby courts dyspepsia in its varied and protean forms; or perhaps some far worse disease, such as delirium tremens, insanity, paralysis, or some of the many different forms of cerebral, spinal, nervous and hepatic disorder; is not the slave to his own passions alone blame-worthy? Or if self-conceit prompts us to persistently cramp and distort our feet by wearing tight or high-heeled boots, and thereby produce corns, bunions, and similar causes of lameness and deformity: or mis-shapes the body by wearing badly fitting corsets, which displace important internal organs and induce tedious and therefore costly maladies of the stomach, liver, heart, or lungs, who is to blame? Or if a boy at school, girl at college, or an older student at home, overworks the intellect, thereby weakens not only his brain and nervous system, but also the entire body controlled by these; and thus induces any-one of the large class of mental and physical ailments apt to result therefrom; to whose folly is the sad result due?

Or if a male or female devotee of fashion or pleasure neglects the ordinary laws of health, shortens his nightly rest, overexcites his nervous system, is irregular in his dieting, and commits other grievous and exhaustive irregularities which both, singly and conjointly, weaken his frame and induce serious disease and shortening of life; who is to be deemed censurable for the outcome? Or if an individual, either in high or humble life, habitually breathes impure air, by neglecting ventilation and the cleanliness of his body and bedrooms, houses, workshops, or factories, and thereby slowly, but surely, induces consumption, scrofula, or some other debilitating and perhaps ultimately fatal disease; to whom is the calamity due if not to the individual himself? Or if a workman labours in a dust or poison-laden atmosphere, injurious to health, as happens in many different trades and manufactures; and persistently refuses to take simple, easy, and safe precautions to prevent disease, and thereby suffers in health, and perhaps ultimately loses his life early; who is responsible for the sequel? Or, again, if a miner, grinder, mason, wool-sorter, or labourer in some other trade which causes a dust-laden or gas-poisoned atmosphere; refuses to take simple and tried precautions to preserve his lungs from being irritated and his blood from being poisoned; whose is the mistake should one or other of many and often fatal diseases or a greatly shortened life be the result? Or if a parent, fond and loving perhaps, but yet unwise, evades vaccination of his children, and thereby renders them subject to small-pox in its worst form; and not only endangers his own household, but also his neighbours, friends, and perhaps the community, nay, the entire race, by creating a new focus of infection; who should be criminated? Or, if parents, negligent or ignorant of the proper sanitary precautions for preventing the spread of contagious diseases like diphtheria, scarlatina, measles, small-pox, and so forth; refuse to isolate children or relatives suffering under any one of these serious and often fatal maladies; and thereby endangers the health and lives, not only of his own home, but that of the far wider circle of the community, to whom the disease may radiate on all sides; with whom does this offence lay? Or, if an individual wilfully or carelessly enters a house or sick-room, where there is an infectious disease, and thereby contracts it himself, or, acting as a new focus of infection, spreads it over the neighbourhood, the city, or the county, who is the culpable one?

And so, also, who is answerable for the many different accidents constantly happening by land and sea; by fire and firearms, drowning, railroad mishaps, and so forth; and by which not single individuals only, but often many persons, lose limb or life? Are they not in nearly every case due to careless-

ness, that perhaps of one solitary person, even when hundreds suffer—and can Providence be justly blamed for the occurrence?

Or again, if parents in a family where there is small-pox, scarlatina, diphtheria, or any other infectious and contagious disease, send their children to school instead of keeping them at home in quarantine, whom should we inculpate if the health and lives of their schoolmates and others to whom these diseases may secondarily spread are thereby endangered? Or if a milkman sells milk which is impure or impregnated with the germs of diphtheria, scarlet fever or typhoid; or if a butcher retails meat which is semi-putrid or diseased and likely to originate disease in human beings by eating it; or if a tradesman vends adulterated food or drink and thereby sows disease and probably death broadcast—on whose shoulders should blame for the result be laid? Or if the owners of property, or architects and plumbers do not make themselves so exceptionally perfect in sanitary matters as to be able to plan and build faultlessly constructed, hygienic and healthy houses, especially crowded tenement buildings, who is to be censured when the sickness and mortality, as usually happens, rises far above those in private dwellings, solely from unsanitary agencies, such as overcrowding, defective ventilation, bad sewerage, and deficient water-supply? Or if the owner of a mill, factory, workshop, or chemical works, neglects to ventilate these properly, and thus remove the dust-laden or foul air, and thereby slowly but surely undermines the health and begets disease among those he employs, whether men, women or children, who should be censured?

Or if a government, or the private owners of a vessel or a barrack, neglect or refuse to give their sailor or soldier inmates the proper allowance of limejuice, and a suitable diet, wholesome sleeping accommodation, pure air, and thereby induces scurvy, typhoid, or some of the many forms of disease thus originating, on whose shoulders should the discredit be thrown for shortened lives and a high sick and death list? Or if the health officers or the municipal authorities of a town or city neglect its drainage or its water supply and its cleanliness, and thereby undermine the health of the inhabitants, making them unusually susceptible to disease, especially of an infectious and and contagious nature, who is answerable for the calamitous result? Or if the proper authorities hazard the health and imperil the lives of the inmates of a school, or a home, asylum, penitentiary, prison, or other public institution, by scantily clothing, under-feeding, or badly lodging their inmates, thereby inducing disease in many forms, especially zymotic ones, to spread perhaps over the neighbouring city or county, on whom should the reproach be cast. Or, again, if the quarantine

officers of a port neglect their duty and permit yellow fever, leprosy, cholera, small-pox, or some other infectious and dangerous disease to enter from abroad and spread over the city or county to occasion much sickness and cost many lives; who should be criminated?

Now in any one of these instances, drawn not from fancy but from facts familiar to every physician, and capable of practically indefinite multiplication, can we justly ascribe the result to the anger of the gods, which was Man's earliest thought, a superstition which, in a modified but somewhat wiser form still lingers among us when we blame the Deity, fate, luck, chance, circumstances, or any other personality, suppositious or real, for such untoward results, when they are wholly the effect of personal or communal neglect of the laws of hygiene, caused by cupidity, obstinacy, or ignorance. Thus it is that, unwittingly, we may, and doubtless often do, break the sixth Commandment, both in the spirit and in the letter, and either kill or make ourselves or our neighbours ill, by unhygienic proceedings and methods. In every one of the above instances; nay, in the vast majority of diseases of every kind, might not the resulting disaster be avoided, and thereby an infinity of sickness and mortality averted, not solely by appeals to Heaven or Providence, but mainly by proper and often simple common sense, sanitary precautions? Is it fair or reasonable to expect God to prevent or undo results for which we alone are to blame: or to cancel laws, for the infringement of which sickness or death are the just punishments? Or dare we plead ignorance of hygienic laws as an excuse for lost health and life, when plain, tried, and efficacious ones have been given as from Heaven itself, which our innate common sense and our interest, no less than a sense of duty, should make us study prior to, and deeper than, any other purely earthly subject?

This still further narrows the subject, and increases our responsibility. For, although we cannot always and only seldom and slightly control the great physical forces of nature, gravity, electricity, and so forth; the vital forces of the human body, and the agencies which act on them to maintain health or cause disease, are much more amenable to judiciously applied efforts. This fact brings health and life largely under the category of the ordinary affairs of this terrestrial globe; and shows that they have to be looked after with similar, and for obvious reasons, even greater care than our business, our lands, money, property, and other earthly possessions. We keep or loose both very much in the same way as these, and as we take care of them by attention to our worldly and our hygienic interests. And in the latter event, many, perhaps most, are clearly victims of their own culpable carelessness, or folly,

indiscretion, ignorance, or obstinacy. Many suffer from the same faults on the part of others; whether these are friends, neighbours, or city and government authorities. But there is the additional difference that we may manage to escape business, physical or other disasters; whereas disease cannot be evaded; but must be faced, fought, and, if possible, overcome. Yet, in face of these facts how often do we play both with health and life, value them only after they are lost, and grudge the time, trouble and money necessary to preserve or restore them.

Thus it is that hygiene, important to all mankind, becomes of unusual interest to those of weak frame; and, thereby, not only predisposed to disease, but also less able than the strong, to withstand it. Some unusually health-gifted individuals appear to escape disease, and live an apparently charmed life, with but little care, and even in spite of the grossest imprudences. But for this they have only to thank their strong inherent Vis Hygienica or protective power of Nature, and their individual vigour. They would be still healthier, if this were possible, if they took better care of themselves. And they would also escape the diseases into which the majority, sooner or later fall, like their fellow mortals, if they were more prudent and less defiant of disease.

Viewing disease from this standpoint, therefore, three things must be evident.

1st. That, as individuals, nations, and as a race, Man in most cases makes, invites, and cultivates his own diseases. For much, nay, for most of the disease now everywhere prevalent, we have ourselves directly or indirectly to blame.

2nd. It follows as a corollary to this that vigour of body, that is health, and length of days, that is long life, are much more at our individual and national disposal than usually supposed. That by proper hygienic or preventive care, the former might be more robust, and the latter more protracted. And that much of the sickness and mortality that now prevail are preventible; and, therefore, not only unnecessary, but also a slur on and a disgrace to our civilization.

3rd. That since, in a sense, our health, life and diseases are mainly in our own hands, the chief source from whence we are to expect aid in private or public health preservation, life prolongation, and disease prevention, is ourselves.

These conclusions will be rendered still more apparent when we come to study the most prolific causes of disease. These consist mainly in injurious excesses or defects in eating and

drinking; impure air or water; adulterated food; insufficient exercise; unclean bodies, houses, and cities; bad moral habits; detrimental employments; ennervating modern habits of life; and immoderate indulgence in disease-inducing luxuries.

Recognizing, therefore, the vast private and public importance of health-preservation and disease-prevention; and the necessity for their more general and deeper study; what are the sources from whence we may derive correct sanitary information for our guidance? In seeking after health we cannot trust solely to our instincts, except these are guided and guarded by experience and understanding. Now we usually derive our hygienic knowledge from the accumulated experience, both medical and non-professional, of byegone ages. But there is another and widely different source from which much sanitary information may be drawn, namely, the Scriptures. Putting creeds, therefore, for the present aside, and taking the Bible just as we find it in the ordinary versions; and examining it critically as we would any other notable literary production, we find that it says much, both directly and indirectly, regarding health, and its various helps and hindrances. The pertinent sanitary maxims found in the pages of this book are such as to vastly increase its practical worth both to private individuals and the world at large. We shall presently see in what respects and to what extent human experience that is lay hygiene agrees with or differs from Bible teaching. Meanwhile it is well to notice that the Sacred Book gives very little information regarding the *cure* of disease. The reason of this doubless is, that as with sin so with sickness, God's laws are framed more towards *prevention* and avoidance of disaster than its remedy. In other words, they are oftener hygienic than therapeutic; both with body and soul ailments. And, again, the minuteness with which the subject is handled, the strictness with which the rules are enforced, and the strong language in which they are couched, clearly indicate the supreme importance of prophylactic, that is preventive or hygienic measures, in the estimation of the Great Life-giver and Health-preserver.

Just as the Bible is not a manual of Botany, or geology, astronomy, ethnology, or even of physiology; since none of these are its primary aim, and they only receive indirect notice: so neither is it, strictly speaking and primarily a medical or hygienic treatise, health-guide, or revelation in which health is the main subject; although for obvious reasons we should expect to find in it more matter touching on this theme than on any other secular science. And, therefore, we cannot expect its sanitary suggestions to be, as a rule, either very prominent or lengthy. Occasionally it speaks specially, discursively, and not in a fragmentary but complete manner, both on private and

public hygiene; and notably so in the Pentateuch, where we find a health code specially designed for the Jews, and through them bequeathed to the world.

But far oftener the health maxims are not specially introduced, but are incidental to the text; and imbedded in other more important matters, like precious gems in a setting of gold. Hence they are generally condensed and pithy. But still they are invaluable, appropriate, and unmistakeable, both in their meaning and application. The health hints of the Bible are of two classes. *First*, those which have a spiritual interpretation and a typical hygienic application. And, *second*, those in which the former aim is subordinate, the main purpose being a distinct, strongly common-sense physiological and hygienic suggestion and command; the aim, meaning, and application of which are adapted to the ordinary conditions of human life. Almost every one of the sixty-six books contains something; either a direct hint or an indirect promise or warning, which may be turned to practical account and made of hygienic value. These health maxims we do not find in the form of a separate and special medico-Biblical treatise; but as part of the general narrative of that unique polygraph, the Holy Scriptures, especially in that portion named the Pentateuch. Here they are numerous and often lengthy; as these books contain the important and masterly private and public sanitary laws promulgated for the Jews during their Wanderings in the Wilderness. And so varied are they that, taken as a whole, "line upon line and precept upon precept" (Is. xxviii. 10) they contain all the ordinary information necessary to enable us to preserve our health, prevent disease, and also avoid death as long as the Supreme Author of all Things and the Great Disposer of all events, permits. But, just as the Bible is not a complete but only a partial revelation of God, and merely tells us as much as is necessary for our salvation, leaving us much to find out, so is it with its hygiene. On this subject it merely says what is absolutely necessary, and does not always enter, though it sometimes does as in the Pentateuch, into minute details (Deut. xxix. 29). Many sanitary matters of altogether secondary importance are not even alluded to. Moreover, as these regulations were given to a migratory people, and for a warm country, some of the details are not strictly applicable to our different circumstances and surroundings. For example, ventilation, an important subject with us, is not spoken of in the Mosaic Sanitary Code; because unnecessary for people who lived much in the open air and in tents. And so also as regards one or two other hygienic questions of importance. Still, taken as a whole, all the essentials and great landmarks necessary for health-maintenance and restoration are there. The whole

of the Scriptures are full of sanitary science, both personal and communal. Their hygienic maxims are abundant and perfect. And the rules regarding public hygiene, the most important branch of the subject, are especially full and minute; and the mass of information presented to the Bible student, truly astonishing.

So that in their combined form they make the Word of God the most concise and complete, as it is the most ancient health-guide, sanitary code, and hygienic system in existence; its sanitary science being in some notable respects in advance of that of the present day, and of importance both to the cause of modern sanitation and religion. So that candid enquirers, even those who deny the Divine inspiration of the Holy Book, and consider it a purely or mainly secular volume, must admit that it is an admirable hygienic hand-book; its sanitary lore being not merely a matter of curiosity and learned research, but of practical value; especially when the various scattered items of knowledge are systematically collected, contrasted and correlated. And must acknowledge that it contains a sanitary mine, in which, in its main principles, we may discover all the elements of modern hygiene; and sanitary methods, which, if carefully and consistently carried out, would prevent many of the deaths and much of the disease which now abound; and thereby make individuals, families, communities, nations, and mankind generally, not only stronger, but also healthier and longer-lived than they now are. Because for ages Man has been, and even now is, largely living in direct ignorance or defiance of its laws. The nearer we bring our private hygiene and our public sanitary regulations to those delivered by Moses to the Israelites, so much the more perfectly will our national and individual health be preserved. And doubtless as the Bible becomes more deeply studied afresh, from this point of view, so will its hygiene become daily more fully recognised as the basis of all true principles of health. The Book we read so often, and with which we are so familiar that we often peruse its pages mechanically, as we walk and do many other things scarcely knowing what we are about, or thinking of what we are looking at, and which we regard with the inattention of an oft-told tale; this contains advice of infinite temporal value, worthy of our closest attention and study.

In modern times we are considerably in advance of and more privileged than the early Jews, seeing that we have now both Bible teaching and lengthy human experience from which to seek advice and draw our hygienic knowledge. But of these, as will be subsequently seen, the former is in every respect the better of the two; not only for its own intrinsic hygienic value but because "the statutes of the Lord are right" (Ps. xix.

8); while Man's decisions are often wrong. These ancient sanitary laws are unquestionably the most useful to mankind at large. Nor is it, even in a moral point of view, a matter of indifference whether we listen or shut our ears to what Jehovah says on this subject. "Keep ye my laws" (Numb. xv. 40; Deut. vi. 25) is assuredly a command that applies as much to bodily as it does to spiritual matters, and includes every precept, suggestion and warning in the Scriptures, and among others the health hints (Ps. xix. 7; cxix. 118; Is. viii. 26; Rom. ii. 14). All of the ancient precepts of the Bible are not of purely spiritual significance; since there are many that are obviously practical in moral, social and political instruction, and notably in hygiene. Apart from its spiritual teaching, over and beyond its esoteric instruction on the mutual relations of God and Man, and its directions to make the human race wise in time, and guide Man unto salvation, the Bible is a great literature and embraces in its boundless and all-engrossing range the most recent of the sciences—sanitation. And the latter is doubtless meant as much for the human race individually and collectively as for the Israelites, and as much for modern as for ancient times (Mat. v. 19); as much for all people as for the Jews; for every age as for the days of the Wanderings. For this belief the strongest reasons may be adduced. Thus—

1st. As the ten Commandments handed down to mankind by Moses are of universal and lasting application, because they are the written and codified moral laws engraved by the Almighty Creator of all on every human heart from Adam and Eve downwards. So the sanitary laws bequeathed to us by the same mouthpiece are merely the codified hygienic dictates or natural laws of reason and common-sense imprinted on every mature thinking medical mind.

2nd. What medical man has been able to add to them as fundamental and comprehensive laws of hygiene? What physician, even of atheistic tendency, has yet been able to detract from, abrogate or hold them up to ridicule as puerile, foolish or erroneous? On the contrary, are not time and experience day by day endorsing, strengthening, and shewing their wisdom, value, and superiority, even over the best of modern accredited systems; and their applicability to all circumstances, places, times, and conditions of human life.

And just as in implicit obedience to the moral and spiritual laws of the Bible, we find the best chance of present and future happiness; so also strict attention to its hygienic or health laws is most likely to preserve health and prolong life. The

physiological precepts are as compulsory as the moral code. Indeed, the Scriptural sanitary maxims amount to commands; and are clearly imperative on all who own allegiance to God. We have no more excuse for neglecting them than for disobeying the Ten Commandments. And a more or less speedy and severe penalty is as certain to follow inattention to the one, as carelessness with regard to the other. Many people, even Bible readers and scholars, err grievously in supposing, or at least acting as if the only laws which it is necessary to attend to strictly in this life, are the spiritual, moral, and the physical; while they forget or ignore the physiological and the hygienic laws of life and health. It is well if we are led to realize this early; since of nothing in this world are human beings more prodigal than of health and even life. For, like our moral and social, so our sanitary sins are sure to find us out (Deut. xxviii. 15; xxii. 35; xxxi. 17; 2 Chron. vi. 28; Numb. xxxii. 23). The natural laws of life and living must not be grossly broken; since even light errors are sooner or later punished. The sanitary is not only as important as the moral code; because if we break either we are sure, sooner or later, to be punished. But it is as much a duty to obey it as it is a privilege, seeing that it is of God's making and God's giving. Not that we should follow the sanitary laws of Moses as given to the Israelites in all their minutiæ and details; because some, and notably those connected with the ceremonial observances of the Jews of that day, are unnecessary for us and our state of civilization; but at least in its spirit and general bearings and often to the very letter, and just as bequeathed. Clearly, therefore, it is as much our duty as it is our privilege to obey both implicitly (Deut. xii. 13). Life and health are evidently "gifts of God" and "talents" or endowments given us to keep and to cherish; treasures we should desire most earnestly and preserve most carefully; and for our care of which, as for other gifts, we shall be hereafter called to give strict account. We inherit them as one of our birthrights; which it is both unwise and criminal to despise and neglect (Mat. xxv.); since God governs the world by justice as well as with mercy (Deut. vii. 9). Regarded from this point of view, how many an individual, family, and nation, ever since the world began, have, like Esau, wilfully or carelessly despised and thrown away two of his most valuable birthrights, health and life. And seeing what care God has taken with regard to our bodies, ought we not, and it is not both our duty, privilege, interest, and wisdom to second his efforts, and do all we can to keep our bodies as we get them from him, that is strong and healthy. This heavenly and paternal interest is shewn; *first*, in fashioning them so marvellously and so delicately; *second*, in caring for them so constantly, by making

such a wonderful abode for them, a world furnished and fashioned expressly for their requirements, with food, air, clothing materials, fuel, heat, and many other things exactly suited for their wants and adapted to keep them in happiness and health; *third*, in supplying us with a brain endowed with reasoning power, thought, judgment, and instinct, to help them to treat the body as it ought to be kept; *fourth*, in giving us a Bible, furnished with lucid, ample, health hints and laws to guide our deliberations and aid in carrying these into effect.

But, even when we know or ought to know better, how often do we act as if our bodies required far less and even none of the constant and minute care and attention that we so often lavish on our clothing, dwellings, and personal effects. Too often, in every grade and position in life, and in every quarter of the globe, do we act thus foolishly. Nevertheless, it is a lesson which, though most of us are slow to recognise, all must learn at some parts of their lives. And they are fortunate who do so early and at the least cost.

Viewed thus, does it not amount to a crime for a believer either in the Pentateuch or in the Bible as a whole, to neglect the sanitary warnings therein incorporated? Yet how often do we commit this mistake, and wait till perhaps brought to our senses by some personal affliction or public calamity in the form of an epidemic; thereby indicating that our belief in hygiene, both Biblical and Secular, is yet more theoretical than practical. Our ignorance of corporeal and mental hygiene, and the false estimates we make of the importance of Man's psychical and physical condition alike, shew our culpable ignorance of a large and important part of the Divine Revelation. The hygiene of the body and mind are next in importance to that of the soul; which is one of the main objects of the Biblical revelation; seeing that it is not beneath the scope of Divine attention. Broadly viewed thus, hygiene becomes a part of religion; and inattention thereto, a culpable neglect thereof. Nor, on the other hand, can bodily ennervation and effeminacy be considered a sign of spiritual madness; saintliness deemed inconsistent with rude health and a robust frame; nor can voluntary exposure to hunger, cold, and discomfort, be exalted into the region of superior sanctity.

Indeed, one of the Ten Commandments is a special hygienic as well as moral ordinance; of far wider application than the limited sense in which it is commonly accepted. "Thou shalt not kill" is a decree not merely aimed at the prevention of sudden or acute murder and suicide, but also at the slower chronic destruction of ourselves and others by the insidious but equally sure means of a neglected hygiene. If, for example, an individual is persistently and wilfully careless

of his food and drink; or of the ventilation of his room or house; or of the care he pays to the amount of sleep or exercise he takes; or his attention to morality; and thereby both courts and incurs immediate disease, and shortens his life; is not that person guilty of self-immolation. Or, if an individual in charge of others, whether his own offspring, or servants, labourers, sailors, or soldiers, neglects the hygienic precautions which it is obviously their duty to perform; and thereby induces disease, which possibly ends in death; are not these individuals responsible for the lives of their fellow-creatures, and clearly guilty of wholesale murder?

The Sanitary Code of Moses, given to the Jews to be by them bequeathed to all mankind, and which forms the main part of the Biblical sanitary record, was as much a part of God's earthly revelation, inspiration and mission, as were His sacred and secular, his moral, social and political laws. His duty was to give them counsel and rules for their guidance for this world, as well as to help them to merit a better one. And these comprised not only purely secular advice to aid them in walking wisely, but also sanitary maxims to help them to keep their bodies healthy and make them long-lived. In other words, to preserve those vital endowments, the loss or lack of which so often make this world, and all its blessings, seem comparatively worthless. In their spirit at least, if not to the very letter, the hygienic maxims and code of Moses must be regarded as much in the light of a Divine revelation as the moral law; and meant not only for the Jews of that day but for ourselves in modern times; and for all mankind of every age, country and creed. We must consider them as sacred as the Ten Commandments we now hold in such reverence and esteem. And we ought to be as willing and as anxious to obey them. Since they are given for our good, they should be enforced for the same reason; and because they involve not only our personal interests and the welfare of our two most valuable earthly possessions, namely, our life and health. To disobey the health creed is therefore not only a crime towards ourselves, but also an insult to God.

It will thus be apparent that not only interest but also duty should impel us to take the utmost care of our health and life. From the simple standpoint of *interest* there are several motives:—thus

a Prudential reasons should sway us. Sickness means an additional and unwelcome expenditure of money, neglect and perhaps loss of business and time; all of which it is desirable to avoid, lessen or shorten.

b The social motives are equally strong. By preventing disease we not only save ourselves, but also our friends,

relatives, and all connected with us, from worry. And in many diseases, especially the infectious ones, we avoid or lessen the chance of giving disease to those near and dear to us.

c Personal motives are equally apparent; as we thus save ourselves pain, distress, anxiety of many kinds, as well as danger of permanent disablement of the ailing organ or organs; in other words, ill-health; and perhaps danger of life.

So also from the standpoint of *duty* there are several reasons for attending to our health and life.

a To ourselves; since to our bodies and to their every part and function, including their vital properties, life and health, endowed by their Maker, must be regarded as talents given to every individual to keep—preserve—and maintain; the former as long as we can, and the latter in the highest possible condition. If we neglect this, we clearly fail in our duty to ourselves, because we thereby break laws, made and given by God, as imperative as the Ten Commandments, and as sure, if broken, to be punished as if we disobey the latter, in the form of ill-health, and perhaps loss of life.

b Our duty to and obedience, love for, gratitude, and reverence of God. Since these laws of life and health are His; made by and bequeathed by Him; clearly if we fail to obey them, we shall certainly be punished, not directly but indirectly, by the penalty, loss of health, and perhaps of life itself. Nor can we expect the Almighty to annul His own laws to please or to save us, either individually, nationally, or socially, Nor can we fairly ask Him to forgive us if we wilfully or even ignorantly neglect these ordinances which He has so distinctly and graciously desired us to obey.

Clearly, therefore, if we would maintain our health and preserve our lives we must obey the laws of Nature—that is God's laws—the laws of Hygiene. To effect this object it is our duty to study them. This, at the present day, we may do in the triple light of Bible teaching, medical experience, and personal knowledge. And it is with our hygienic efforts as it is when we have to deal with actual disease. While we wisely and earnestly petition God to preserve our health and lives (Philip iv. 6), that is to keep us from disease; we ought to supplement this by what is most likely to cause our desire to be fulfilled, namely, by employing carefully regulated hygienic action; such as we can and do ask Him to bless. We ask Him to guide and direct our deliberations; and to hold up our goings that our footsteps slip not (Ps. xvii. 5). And thus in

this, as in *all* our ways, we acknowledge Him (Prov. iii. 6). Heaven helps those who help themselves; or who are aided by others. Nor should we forget that, without the aid of the good Samaritan the man who fell among thieves would probably have died of his wounds (Luke x. 30). Without this judicious union of prayer and practice, Asa's fate may be ours (2 Chron. vi. 12). It is true that, whether our object be disease prevention or disease cure, we can never be certain that our petitions will prevail. But by acting thus we obey the Divine Command, and make all our requests known to God. And in either event, success or failure, we moreover ought to plead that our human desire may completely harmonize with the Divine will, feeling assured that whatever happens, even should the answer be adverse, all will be for the best, and if not for our speedy at least for our ultimate benefit. The Bible distinctly promises that the Almighty will both hear and answer our prayers for health-preservation, as certainly as He did those of the Israelites of the Exodus (Deut. xxx. 19-20). He permits us, as He did them, to choose betwixt life and death, good and evil (Deut. xxx. 30). If we seek His face, He will now, as in olden times, deliver us from pestilence and death (Ps. xci. 3-7; 2 Chron. vii. 14-15). He sends or He withholds "angels of evil," that is agents of physical suffering, and destruction (Ps. lxxviii. 49). It is chiefly in trouble that He proves Himself to be a present help (Ps. xlvi. 1). And His aid is efficacious when that of our fellow men fails (Ps. lx. 11). He listens specially to united prayer (Mat. xviii. 9). Nor should we forget that the boon of continued good health may possibly be withheld for the simple reason that we do not ask for it (James xxi. 2); or because we ask for it amiss (Jas. xiv. 3; John xiv. 13-14). Effectual prayer for national health is also assured; while for this, neglect of the public sanitary laws of the Bible are as unjustifiable as forgetfulness of the maxims for indoor health (Deut. iv. 7-8). And with an evident view of removing every vestige of excuse for non-compliance with His will, He says to us, as to the Israelites of old, "For this command with which I command thee this day is not hidden from thee, neither is it far off. It is not in Heaven, that thou shouldst say, who shall go up to Heaven, and bring it unto us, that we may have and do it? Neither is it beyond the sea, that thous shouldest say, who shall go over the sea for us, and bring it unto us, that we may have and do it? But the word is very nigh unto thee, in thy mouth, and in thy heart, that thou mayest do it" (Deut. xxx. 11-14). In this, as in other matters, we may perchance be left to our fate by God; but this is only likely to happen if we have forsaken Him (1 Chron. xxviii. 29; 2 Chron. xv. 2; xxiv. 30; xii. 5).

But Hygiene is a many-sided subject. And in order to study it Biblically and comprehensively, it is necessary to simplify and methodically sub-divide it according to its various aims. With this object in view, it is necessary to remember that the human race may, at the present day, and in the light of modern science, be regarded hygienically from three different points of view, namely:—

1. In their animal capacity and relation to the natural conditions essential to life which surround us; the air, food and drink which we use, and that supply the force which makes their special organs perform their mental and bodily acts; the soil on which we live; the sun which warms, lights, nourishes us; and certain other things.
2. In their *mental*, *moral*, and *religious* capacity, as possessing inner sources of action, thoughts, feelings, desires and habits, which influence health, and require self-regulation and control.
3. In their *social* and *corporate* capacity; as members of households, subject to sexual influences, and as units of a community controlled by political influences and customs, and affected by trades, dwellings, and such-like.

The Hygiene included under the first and second heads is usually far more in Man's personal control than that of the third variety. Nor can we always follow the indications of the latter, however much we may desire to do so. Thus, a soldier, sailor, or citizen may know well how essential fresh air, good food, and pure water are for health and even life: may even strive hard to have them; but yet have little or no power to attain his object, because both he and they are under the management of others. For this reason it becomes necessary to redivide the science and art of hygiene or health preservation into

1st. *Private* or *Personal* Hygiene, which includes the care of Man's individual existence, and improvement of his own health and physique.

2nd. Public, *Social* or *General* Hygiene, which deals with Man in his corporate capacity; studies the sanitary interests of communities; and settles questions which are neither of limited personal interest, nor of such widespread importance as to be national. This includes the care of streets, sewerage, nuisances, occupations, professions, trades, quarantine, and arrest of infectious diseases, homes, schools, workshops, factories, reformatories, barracks, ships, seaports, hospitals, prisons, charities, water and food supply,

burial arrangements and disposal of the dead, site and soil, roads, ventilation of houses, regulation of slaughter-houses, cow-houses, bakehouses; vaccination; public parks for recreation and city ventilation, bathhouses for cleansing; gymnasia for exercise. The laws relating to these should never be made too ambiguous, tentative, or permissive; so as to allow of their evasion by the careless, ignorant or unscrupulous. And, like those of private, national and racial hygiene, should always be kept as purely medical questions; and altogether removed from the domain of politics.

3rd. National Hygiene; the more complex study of the health of the nation as a body; its laws, customs, highways, open lands, forests, rivers, religions, races, climates, food, physical surroundings, and other matters.

4th. Racial Hygiene; which contrasts the circumstances which affect the health of races, and the human brotherhood as a whole. This necessitates the sanitary organization of nations, in which the United States of America enjoys the honour of being the first to take the initiative.

5th. To these might be added another section, namely the Hygiene of Disease. Although, strictly speaking, this is included in what is termed the therapeutics of sickness. A large part of the rational modern treatment of disease is hygienic; far more so than that of former times, up to thirty or forty years ago. And consists in increased attention to diet, exercise, rest, work, and abstinence from hurtful things and ways; although this is generally too slow for most people, who desire some shorter and speedier road to health; and put more faith in medicine. And, although we may always require the latter and therapeutics in our treatment of disease, the latter is daily becoming more hygienic. Physicians are becoming more assured, and in time the public will see the wisdom of the conclusion, that the most scientific philosophical, and often the speediest and best mode of treating disease is, not by opposing Nature but by assisting her by hygienic methods. And we must remember that, if strict attention to hygiene is necessary in health, it is surely tenfold more so when disease attacks us, the system is weak, and therefore requires additional care and attention even to the minutiæ of hygiene.

These different departments of hygiene are interdependent. Whatever affects personal, influences public hygiene, as it also

does the national, racial and morbid hygiene; and vice versa. Nor can they ever be dis-associated either in theory or practice. The sanitary welfare of individuals may be of such importance that it merges into a public question. So, in connection with the latter, there often arises a necessity for *State* interference, by which Governments make laws and see them carried out for the well-being of the public at large, because meant to protect them from the insecurity to life and health that too often springs from the cupidity, ignorance, carelessness, or perversity of private individuals or companies. Even this, however, ought to be under the control of the people as a body, and purely non-political; since it happens that corporations, local, and even national, governments not unfrequently fail in their duty to the public who elect them.

The human frame is thus only to a certain extent self-sustaining and self-regulating. Nor can it keep itself in health beyond a certain limit; or ward off and conquer those manifold morbific agencies, internal and external, constantly waiting to undermine or destroy health and life. The soundness of its various members, and of the body as a whole, the proper performance of its functions and their general condition, are now well known to depend on and be influenced by certain agencies, through and by which health is maintained, and the effect of morbific agencies counteracted. These health factors, which under certain conditions may be converted into or become disease factors, and which we are to study in turn from a Biblical point of view, consist of:—

1st. Those by which the body is sustained and grows: our food, drink, breath, the light which stimulates us, heat which warms, and clothing which protects us.

2nd. Those agencies which purify the frame and keep it from defilement: cleanliness of the person, and of streets, communities, &c.

3rd. Those which refresh and invigorate us; sleep, work, recreation.

4th. Those which keep the soul and the mind in health: our moral, mental, and spiritual culture.

But besides these factors of personal hygiene, there are certain agencies which affect the sanitary welfare of communities, and by which villages, towns, cities, nations, and even races, are liable to be influenced for good or for evil. The chief of these are:—

1st. The site, size, ventilation, cleanliness, drainage, &c., of dwellings.

2nd. The cleanliness, sewerage and condition of streets.

3rd. The modes followed for disinfection and disease prevention.

These different agencies, which may thus become sanitary or unsanitary, and prove either helps of health or sources of sickness, according to circumstances, especially the judicious or injudicious use that is made of them; are all spoken of at greater or less length, and with more or less force in the Bible. In their consideration, in turn, from a Scriptural point of view, the great landmarks of personal hygiene must take precedence of those on public sanitation. And, in order to simplify the subject to non-professional readers, and shew the full force, depth and value of the Bible health hints, each chapter and subject will for the most part be prefaced by certain general details regarding modern hygiene; some of the physiological laws on which health preservation is based, and for the proper management of which these sanitary maxims were specially designed; and also brief remarks on the pathological evils, or functional and organic perils apt to result from their neglect.

Practical Utility of Hygiene

Of this, medical statistics among the Jews themselves is very convincing. The majority of the health hints of the Holy Bible are connected with the early history of the Children of Israel. To this race the world of modern times is much and variously indebted. For to it we indirectly owe not only our Saviour, but also God's Holy Bible and Pentateuch, with its invaluable collection of sanitary maxims; and Moses, one of their chief representatives and the human agent, through whom these were bequeathed to Man.

The history of this People, from a political—social—moral—intellectual and spiritual point of view, is given, no doubt purposely, with marked minuteness. We have their various wanderings, rebellions, murmurings, punishments, repentances, returns to God, and repeated backslidings after forgiveness, even those of their specially-endowed leaders, Moses, Aaron and Miriam, chronicled with scrupulous accuracy, doubtless as an example and a lesson. For in these details do not men of every age and race find a type and counterpart of their own life, both individual and national? Like them we are fed and cared for; but yet, like them, we often murmur by the way and "in our tents," rebel, sin and suffer socially, morally, physically and mentally: then repent, turn to God and perhaps again prosper (Ps. lxxviii.). So that like the Israelites of 3,000 years ago, God's children of modern times are alternately happy or miserable, prosperous or unfortunate, healthy or sickly, as they obey or neglect His spiritual, social, moral, and physical laws.

Contrasted with other nations, the Israelites of old were a healthy and long-lived race. And during their Wanderings in

the Wilderness their bodily welfare was as carefully watched over as were their souls' interests. Sprung from an ancestor, doubtless selected for his physical and mental vigour, as well as for his moral and spiritual aptitude, they were mainly sustained in general and special salubrity, as the modern Jews no doubt are, by their inherent hereditary stamina and strictly enforced laws, designed to make them sanitarily and physically, as well as socially and spiritually, superior to other nations, and, in fact, the dominant nation of the World. But for their rebellion their bodies would doubtless have been as well preserved as was their raiment until they reached the Promised Land (Deut. viii. 4). For their sins and shortcomings, however, none of them, not even Moses, Aaron, and Miriam were thus gratified; but died by the way: Moses alone of the many who originally left Egypt, having a far-off glimpse of its beauties and comforts (Numb. xx. 12). As it was, so well were they protected from disease by God's personal superintendence, and so healthy were they kept by his admirable sanitary laws, that they only suffered occasionally from chronic ailments like leprosy, and from more acute and violent ones like plague. And in every case these afflictions were not only sent, but also stayed and cured by Divine agency. Moses, educated by the Priests, then the custodians of knowledge, medical and otherwise: and doubtless taught medicine as well as other sciences by them; and afterwards Joshua, were their chief sanitary officials and law-makers; while the High Priest and Levites were the health officers and agents for their cure: sacrifices and the prayers of the leaders and people themselves being their main resource in sickness. While Hygienic measures, aided by the strict quarantine and special religious observances, were the only or chief sanitary means employed in infectious and contagious cases.

Like the Brazen Serpent, a believing look at which prevented or cured the venom of fiery serpents, so the application of the Mosaic Sanitary Code prevented and cured the infectious and contagious diseases to which the Israelites were then exposed (Numb. xxi.). And, like the blood on the lintel of the door-post in saving the first-born in Egypt, so proofs of the observance of His health laws in tent—house—village and city, made the destroying angel pass them by; as they also would in modern times if they were equally closely followed. In proof of this statistics furnish valuable evidence. The influence of race on mortality is difficult to separate from habits of life. But of this the Jews form the most notable example. And doubtless in their case both factors combine to produce the result in question.

Thus it is both interesting and important to notice that the

Jewish race, notwithstanding their many dispersions, oppressions, and privations, still exhibit wondrous vitality, both individual and collective. This is shewn by statistics, which prove that they are the longest lived and healthiest people in existence. Thus, their mean age is 48 years; while among Anglo-Saxons it is only 33 years. Again, in Germany the excess in the average duration in life in favour of the Jews over Christians is 11 years; and in France 11½ years. So in Frankfort on the Maine the average age of Christians at death is 36·9 years, and that of Jews 48·7 or 11·8 years more. This reaches even to the age of infancy and childhood; an age at which the mortality among other races is everywhere very high: whereas among the Jews it is not over 10 per cent. Only among the Society of Friends is this high-average longevity anywhere approached, the average adult life among these, and for similar reasons, being ten years above the general mean. Similar testimony is furnished by the death-rate. Thus, in Prussia, while this is 21·6 per thousand among the Jews, it rises to 29·6 among Christians. Leguean gives still more extensive evidence when he points out that in all European countries the mortality among the Jews is much smaller than among either Catholics or Protestants. So after the first year there is a smaller rate of mortality among the infants of Jewish parents in Russia and Austria than among those of other persuasions. So, again, while the rate of increased population by births in most countries is less among Catholics than among Protestants, both are left far behind by the Jews. All of these satisfactory results among the Jewish race are doubtless due partly to increased vitality of the Semitic race; but also largely to the beneficial influence of certain manners and customs more or less connected with their religious tenets, the nature of their occupations, and their temperate methodical mode of life; briefly in fact to their superior hygiene.

Moreover, as a race, the Jews, though despised, maligned, degraded, and not localized, have struggled against unjust laws, massacre, banishment, persecution, disease and adversity in every shape and form; have multiplied so that they now number ten millions; and enjoy both a remarkable immunity from disease but also uncommon longevity. For this they are unquestionably indebted to the following combination of circumstances, all calculated to prevent degeneracy, and therefore such as makes their study desirable and to be received as a sanitary example worthy of the closest imitation:—

1st. To their having sprung from parents endowed with great original vitality, enabling them to struggle successfully against disease, especially the very fatal infectious class from which they have a strange

immunity; and rendering them capable of widespread acclimatization.

2nd. To having their strength bequeathed and inherited through a comparatively unmixed lineage.

3rd. To their everywhere and as a duty closely following the minute and superior public and private hygienic and moral laws of Moses; and thereby becoming noted for certain wise conduct and traits of character: thus—

a Their personal and public cleanliness and disposal of waste products.

b Periodic, physical and mental rest.

c Extreme sobriety, a drunken Jew being seldom seen.

d Purity of food, air, earth, and water; and especially constant supervision, selection, killing and dressing of animal food; and purification of water.

e High morality, purity of life, regular habits, abstemious eating, thereby ensuring good personal health and lessening the number of a sickly and short-lived class of children.

f Early married life; and avoidance of a rash and hasty choice.

g Strength of the Jewish mothers, entailing fewer deaths at childbirth.

h Smaller families, correspondingly greater inherited strength of the children, and more care devoted to them.

k Intensity of the family feeling, making children subject to incessant vigilance; and the aged objects of veneration and care.

l Universal voluntary outcome of the dictates of charity towards the poor and the needy.

m Serenity of the Jewish mind and temperament; springing from their deep-seated faith in God.

n Pursuit of occupations which do not involve great risk to health or life; for example, shop-keeping, merchandise, banking, art, science, literature, politics: and avoidance of such as do involve this risk; such as agriculture, labour, mechanics, sailoring, mining.

The Jewish nation has not taken the political lead in the world which its earlier history might have anticipated. But in indestructability and personal robustness, mental and physical, it stands alone and unsurpassed. Nation after nation has had

its rise, supremacy, fall, and practical extinction. But the Jews continue to increase in numbers and social importance. Nor is their pristine strength and health abated. In these matters they unquestionably take the lead over all other races, past and present.

Among Gentiles, in addition to the Biblical proofs of the utilitarian value of sanitation among the early Hebrews; this is easily proved by the present Century recrudesence of the art and science among enlightened nations. Still, even at the present day, notwithstanding its strong Biblical endorsement, sanitary work appears to many non-medical minds not only useless but a mere waste of time and money. It is, therefore, a matter of great moment to shew clearly the *cui bono* of this comparatively novel and recent art and science; and to indicate its practical value by statistical evidence of its efficacy. Fortunately, young though both the modern art and science of hygiene are, statistics, past and present, already prove incontestably that they are fraught with results of the utmost importance both to individuals, families, communities, nations, and the race at large. Thereby shewing that sanitation is a subject worthy not only of the deepest study but also capable of the widest application. Abundant proof can be given from many sources of the efficacy of increasing and minute hygiene of various kinds, not only in increasing health, but also in diminishing sickness and lengthening life among all classes, rich and poor, young and old; in cities and country districts; among landsmen, soldiers and sailors; and among people in every trade and profession. Among barbarous tribes sanitation is of course a dead letter; and even among many semi-civilized ones. But among the more civilized ones, whether we take our statistics from England—Germany—France—America, or any other of the leading nations of the world, we find that in all life has by these means, especially by improved public and private sanitation, been prolonged more than 25 per cent. during the past 75 years; the number of deaths reduced; and the duration of sickness lessened more than one-third. The three best tests, namely, longevity, morbidity, and mortality, alike testify to the great and beneficent utility of sanitary science. The statistics of the present quarter of a century during which practical hygiene has made the most rapid strides towards perfection; and has risen theoretically so as to be deemed worthy of classification among the sciences, give still more startling evidence of Utility. This is proved by the following facts, gleaned as they have arisen from various leading medical periodicals of the day, and other authorities.

Thus Fowler, in 1892, tells us that 50 years ago the death-rate in this country was between 22 and 23 per thousand, and

remained practically stationary down to the seventies, when the State embarked on its useful career of sanitary legislation. From 1876 to 1880 the death-rate was 21 per 1,000; from 1881 to 1885, 19½; from 1886 to 1890 it was under 19. In other words, had the death-rate remained during 1886-90 the same as in 1861-65, no fewer than 100,000 more deaths would have occurred. Nor was the reduction only in the death-rate generally. There had been a great reduction in what were called preventible diseases. During 1861-5 the death-rate from zymotic diseases was 4·25, whereas during the last five years it was only 2·21. This enormous reduction had arisen from wiser and better sanitary legislation. Again, there has been a distinct lowering of the general death-rate in Great Britain during the past seven years from judicious sanitary measures, stimulated mainly by the wise Public Health Acts of 1872 and 1873. During this septennial period, moreover, the population has nearly doubled itself; and that although sanitary dangers were necessarily considerably increased by the massing of people in towns and cities. The good result has flowed solely from increased efforts to give the communities good drainage and the people pure water, fresh air, and other judicious sanitary items. Thereby, while the mortality in England in 1690 was 1 in 33, and in 1780 it was 1 in 40; while during the period of 30 years (1840-70)the annual-death-rate was 22·3 per 1,000. Whereas, during the succeeding nine years it was only 21·6; thus shewing a decrease in the latter of 0·7 per 1,000. This fractional decline may appear trivial to persons unaccustomed to vital statistics; and to many almost a ridiculous evidence of sanitary progress. But in the aggregate it signifies that during these nine years more than 150,000 human beings have survived who would have died, according to the previous death-rate. And also that only 97 people have died to each hundred in the previous 30 years. And it further signifies that the mean duration of life has been increased by about a year and a half. The result is that while half a century ago the average duration of human life in Great Britain was about 30 years, it now is 49 years or more than half longer. This evidence of increased health is most marked in large towns; and smallest in suburban and rural districts; especially in mining and manufacturing centres, where sanitation is often only a pretence. This pleasing result is due to the increased hygienic precautions of earnest and enlightened sanitarians; and the efforts to improve drainage, the water supply, and house ventilation. And although the conditions in other respects were more unhygienic, the population of the country during the same period nearly doubled itself. Many small villages grew into populous towns; the people being more massed into great commercial centres, bringing with this

concentration certain attendant dangers, affecting all overgrown and crowded populations. That sanitation has a yearly increasing influence on mortality is further shewn by more recent statistics, namely, the Registrar-General's returns for 1883; which prove that the English death-rate during the past three years had averaged only 19·3 per 1,000, thus shewing a decline of 2·7 per 1,000 from the mean rate during the 35 years ending 1875; since which the Public Health Acts have fully come into operation. This means that nearly 214,000 persons, or more than 71,000 per annum, are now alive in England and Wales who would have died had the old death-rate of 1870-75 been maintained.

As with nations and races, the same fact is apparent in cities. An interesting and important fact intimately connected with sanitation is the distribution of people and its effect on health. Thus no less than one-seventh of the population of Great Britain lives in London. And a large proportion of the rest in other large cities and towns. The population of cities is yearly increasing, both actually and relatively. Their mortality also increases with their density. That this massing seriously influences health is shewn by the fact that in dense communities like these the mortality of all ages after 25 is high, and mainly due to pulmonary disease, doubtless arising chiefly from vitiated air. Still, thanks solely to the progress of civilization, enlightenment and sanitation, the mortality of cities has been gradually diminishing. This has been apparent with that of London since the 17th Century. Whereas, at the beginning of the 19th Century it had reached 29 per 1,000; in 1840 it was 25·3; and in 1870-8 only 23. Or to put the same fact differently, whereas in 1805, not a sickly year, one in every 20 persons died in London from all diseases; in 1850 the mortality was only 1 in 40. The mean death-rate of the last decade in London was 24·4 per 1,000; whereas during the last eight years it has fallen to 22·8 per 1,000. Like results have been obtained in other cities. In Manchester, Liverpool, and Glasgow there has been a similar decline in the death-rate; mainly from an improved water supply, regulated drainage, extended air spaces, and pulling down old and dirty houses. Thus in Liverpool before proper measures were introduced the annual percentage of deaths was 38 per 1,000. Now it is only 24. In Croydon it has been reduced from 25 to 16; in Salisbury from 40 to 17; in Dover from 26 to 14. So, for the same reason, the death-rate is steadily diminishing in all the large cities of France, Belgium, Netherland, Sweden, and Germany; as it is also in those of America. Thus in the 14th Century the rate of mortality in Paris was 1 in 16; whereas now it is 1 in 32. On the other hand, the same thing cannot be said regarding

countries where sanitation has made little or no progress. For example, in S.E. Europe, in Asia, and Africa.

Again, another marked benefit of improved sanitation is, that it affects not only mortality but also human longevity. Thus, in nearly all civilized countries the average duration of life steadily increases. For example, in Geneva, where accurate registers have been kept for 300 years; the average life between 1560 and 1600 was 21 years 2 months: between 1600 and 1700 it was 25 years 9 months; between 1700 and 1800 it was 32 years 9 months; while in 1833 it reached 40 years 5 months; that is it nearly doubled itself in less than 300 years. The mean lifetime of both sexes in England was calculated some years ago at 40·858, or nearly 41 years. That of London is nearly the same; being least in the most crowded district, St. George's, in the East, where it was 28; and double that in Kensington and Hampstead. So in the very crowded city of Liverpool it is 34; and only 48 in Bradford; and 44 at Leicester; all for obvious hygienic reasons. In five years 1876-80 the mean age of death in England was 43·56 (females 45·37). This shews a clear and by no means inconsiderable gain of $2\frac{3}{4}$ years, added to the life of every inhabitant, notwithstanding an increased birth-rate, density of population, and the general insanitary condition of towns caused by their increase. Again, while in the 16th Century only 3 per cent. lived to be three score and ten; now no fewer than 18 per cent. live beyond that age. And as many now live to be 70 as then died at 43. The Registrar-General's report for England in 1885 shews that as an annual income derived from money invested in sanitation and the direct consequence of sanitary interference, we have added nearly two million years of life to our population.

As with cities, so if it were necessary similar statistics might be given to shew the increased healthiness and diminished mortality that have followed other sanitary improvements in towns, villages and rural districts; especially by paving, removal of nuisances, good water supply, sewage disposal and drainage.

Again the rate of infant mortality, a good test of the health of a city or district tells a similar tale. Thus, whereas in the 16th Century more than one-sixth of the children died in their first year; now it is less than one-sixth. Again, dividing the last nine years into three portions, the death-rate among infants was 156 per 1,000 in the first third; 159 in the second; and 145 in the last third. This amounts to an annual saving of ten thousand infant lives in the last as compared with the first period of three years.

Again, the Army returns furnish similar proofs of the value of sanitary reform in increasing the health and longevity of

soldiers and the efficiency of armies. Thus in the second quarter of the present century the mortality among British soldiers was about double the rate among civilian males, even in healthy districts. The rates are now about equal. Again, the mortality from consumption, which used to be very common, was reduced between 1846 and 1866 by more than one-half. The Crimean Army was almost decimated and destroyed in January, 1855, by fever, dysentery, and diarrhœa. Whereas in the subsequent Ashantee and Abyssinian Wars the sickness and mortality were very low, from due attention to judicious hygienic measures and conditions. The same thing is shewn by the death-rate in the British Army before and after the post-Crimean War Sanitary Commission was formed. Thus the following table shews how much the mortality was reduced in the chief foreign stations after the commission had effected its reforms.

TABLE II

of Deaths

	Before per 1000.	After per 1000.
Gibraltar	22	9
Malta	18	14
Ionian Islands	27	9
Bermuda	35	11
Canada	20	10
Jamaica	128	17
Ceylon	74	27

When the Royal Commission of 1857 was held British soldiers were dying at the rate of 18 per 1,000 at home. At that time their profession was more fatal in times of peace than was life to the inmates of the filthiest and most poverty-stricken parts of our crowded cities. The return of 1883, made 26 years afterwards, shewed that it was only 6·28, that is nearly 40 per cent., less than the death-rate of the most healthy districts of England and Wales. Thus more than 1,000 men were yearly saved to the State; and a still larger saving of service from men incapacitated by sickness. Again, in 1852, there were dying of consumption alone in the British Army more men in two years than at present die from all causes in three. The British troops in India before the Crimean War had a death-rate, exclusive of wounds in battle or slain in action, of 69 per 1,000: or 10 per cent. from death and invaliding and 10 per cent. more incapacitated by sickness. At present the deaths are only about one-sixth of that number; and the sick little more than one-half.

So that during a single decade more soldiers lives have thus been saved in that army alone than formed the entire British Army at Waterloo. So also in Jamaica the mean death-rate of British troops previous to 1836 was from 128 to 307 per 1,000: whereas between 1837 and 1855 it fell to 50·8. In the Windward and Leeward Commands the fall was from 81·5 to 62·5. At present, 30 years later, the rate is only one-quarter of the latter; which gives a mean of 15·75. Again, among the troops in Jamaica fevers before 1837 killed 101·9 per 1,000; whereas after 1837 the rate was only 36·9. At present the ratio in the West Indies for 10 years, 1873-82, for all diseases, including yellow fever, was only 9·30 per 1,000. Consumption in the same region killed 10·4 per 1,000 of these troops before 1837; and only 8·6 after: in 1883 the figures were only 1·2 per 1,000; and the mean for the four previous years was only 0·57 per 1,000. All this in these several military centres was brought about simply by increased attention to the ordinary principles of hygiene and improved sanitation of camps, barracks, dieting, drill and so forth. So for the same reason the great attention paid to sanitary matters, the Germans lost comparatively few men from disease during the late Franco-German War.

Naval sanitation has been equally successful in reducing disease and death and prolonging life among sailors; both in the merchant services and in war ships of all countries.

In modern Hospitals the materially reduced mortality and shortened residence are also largely due to improved hygiene. The sanitary statistics of Reformatories, Foundlings, Asylums, Homes of various kinds and other Charities and Public Institutions are equally conclusive as to the value of advanced hygienic improvements. The hygienic custody of prisons is equally illustrative. Whereas these were once great centres of infectious and contagious diseases, like small-pox, typhus, enteric, erysipelas, diarrhœa, and dysentery, these affections are now all but extinct as causes of mortality. The total mortality from all diseases is not more than one-third of that which formerly existed. In the same institutions the deaths from consumption are less than half the number 30 years ago. These improvements are due to good water, judicious dieting, and better cell accommodation.

The same great fact, including increased healthiness diminished mortality, and prolonged lives, is still better shewn by the great reduction in the amount of prevailing sickness and mortality accruing from special hygienic legislation. This will be best shewn by taking some of the best known and most dreaded diseases as examples. Thus, from fevers, including typhus and typhoid, the Registrar-General of England reports

that in 1865 there were 23,034 deaths, and in 1875 only 13,063; shewing a decrease of 9,945; although the conditions favourable to their development have increased. A similar decrease is apparent in other of the six chief zymotic diseases, namely, small-pox, measles, scarlatina, diphtheria, whooping cough, and diarrhœa. The same authority shews that the deaths from all zymotic diseases have fallen, thus:—

Scarlet Fever	from	972	to 716	per million.
Typhus	„	885	„ 484	„
Diarrhœa	„	1076	„ 935	„
Phthisis	„	2475	„ 2116	„

The main sanitary agent in effecting this improvement can often be pointed out. Thus the deaths from cholera have been greatly diminished since 1848, the year in which the water supply in Great Britain was improved. In Glasgow, whereas in three epidemics of cholera between 300 and 400 people died; only 68 died after 1850, when a good supply of the purest water was brought into the city from Loch Kathrine; instead of, as previously, from the muddy and impure river Clyde. In Manchester pure water has also caused the total mortality from cholera to be reduced to one-sixteenth of the previous amount. Again, scurvy, once so disastrous and deadly, has almost ceased to exist in the British Navy since the food supply has been improved. In the mercantile marine it has decreased 70 per cent. from the same cause, and since the passing of the Merchant Shipping Act in 1867. Consumption, the most fatal disease of any in Great Britain, is now not more than two-thirds of what it was twenty-five years ago, owing to better housing of the poor, the gradual rise of wages, cheapness of clothing, and the general advance in the condition of the labouring classes, among whom the disease chiefly occurs. Ague, formerly very frequent, and a common cause of death in England, rarely kills anyone at the present day, owing to improved drainage of lands and marshy regions. While the lowering of the subsoil water, and the cultivation of the surface of the land have made frequently pestiferous places, like the Fens of Lincolnshire and Cambridgeshire as healthy as the Weald of Sussex or that of Kent. The continued fevers have also been reduced in frequency and fatality. For example, typhus has not been epidemic in Great Britain for the last 13 years. The deaths from enteric have gradually sunk since 1865 from 1,100 to 400 per million. Small-pox during the past twenty-five years, in which the compulsory vaccination law has been in existence, the death-rate has only been one-fourth that of the last century. Ireland, said to be the best vaccinated country in the world, is at this moment practically free from small-pox. These facts, and many more might be given, prove—

1st. That efficient vaccination generally protects entirely and averts small-pox.

2nd. That where it does not entirely prevent this it *modifies*, that is, renders it milder, shorter, less fatal and loathsome. Thus, in the late small-pox epidemic at Sheffield the death-rate of those vaccinated in infancy was only 5 per cent.; whereas, in the unvaccinated it was 48 per cent., or more than nine times higher. Of the cases sent to hospital not one had been re-vaccinated.

And since 1874 not a single death from small-pox has occurred in the German Army, in which vaccination and seven yearly re-vaccinations are practised. Whereas in Montreal, unprotected from vaccinations, the mortality during the recent epidemic was frightful. No better proof of the hygienic or protective effect of vaccination on the virulence, fatality and occurrence of small-pox could be had than the following statistics of

TABLE III

Annual Average Deaths from Small-pox in England.

a	Before the introduction of Vaccination - - -	3000	per million of the population.
b	Average of three years (1838-40) when vaccination had become to a great extent diffused, but before any public provision was made for its performance - -	770	Do.
c	Average of 12 of the years (1841-53) when Public Vaccination was gratuitously provided but not obligatory - - -	304	Do.
d	Average of the next 12 years (1854-65) during which Vaccination has been, to a certain extent, obligatory - - -	202	Do.
e	Average of next 14 years from 1866 to 1879 - - - -	215	Do.

It has been calculated that the chance of dying from small-pox is about 31½ times greater among the unvaccinated than among the vaccinated. Even the natives of East Africa, ignorant and unlettered, yet gifted with a large share of common sense, have implicit faith in vaccination, after witnessing the

benefits derived therefrom; and seeing that none of their number who are thoroughly vaccinated in a family have taken small-pox; while non-vaccinated members of the same families are seized. The benefit of re-vaccination after stated periods are equally apparent from statistics. In the late Sheffield epidemic, fatalities among those vaccinated in infancy occurred only in adults in whom from 20 to 25 years had elapsed since vaccination, the original protective power having been gradually lost. And in these, moreover, it was secondary complications that usually caused a fatal termination. Vaccination for other infectious and contagious diseases is still in its infancy, although it doubtless has a great and widespread future before it. As an example, the results of experiments in vaccinating for cholera is to make the security among the vaccinated to those unprotected against a fatal attack as $22\frac{1}{4}$ to 1. So, also, it was the unsparing quarantine carried on after the beginning of the 17th Century, that in little more than 100 years made the plague disappear from Western Europe.

But the great value of wise sanitary measures such as those which now form a very important element of government and local administration in Great Britain and all enlightened countries, is markedly shewn by their effect in decreasing the frequency, intensity and mortality from zymotic diseases. The general rate of mortality of these when compared with that of the ten years 1861-70 has so far lessened as to exhibit a saving of 1,144 lives annually to each million of persons living. This decrease is largely in the most preventible of these zymotics. In scarlet fever the annual deaths per million having diminished from 972 to 716; diphtheria from 185 to 121; fever from 885 to 484. Enteric, the mortality from which affords a good test of efficient sanitary administration, shews a fall of no less than 45 per cent. Deaths from diarrhœa fell from 1,076 to 935 per million. The same report furthermore shews indirectly the same fact in an indirect way, and not only proves how much small-pox is diminished by proper sanitation, but also how deadly a disease it still remains, but for this agency. Thus the mortality from small-pox rose from 163 to 236 per million, largely from the serious epidemic of 1871 and 1872; but partly from its increase among adults who neglected re-vaccination. Deaths from zymotic diseases, consumption, and those of children are the three classes of diseases most preventible by judicious hygienic measures.

Again, childbirth and its subsequent conditions have been largely divested by prudent sanitary precautions both of its former sufferings and dangers. Its duration has also been diminished. Some causes of mortality therefrom have been almost completely removed. The safety both to mother and

child has thereby been increased, and the mortality among both largely diminished. So that thus the great object of perfect obstetric science, namely, the delivery of living children with safety to the mothers is now far more nearly approached. Thus the statistics of the Registrar-General of Great Britain shew, that in ten years from 1861 to 1870 the deaths from childbirth and puerperal fever in England and Wales averaged 60 in every 100,000 women between 20 and 55 years of age. Whereas, between 1876 and 1880 they fell to 53 in the same number. Some years since it was estimated that the average mortality in childbirth in Great Britain was something like 1 in every 120 women confined. Whereas from 1883 the Registrar-General's report shews that the maternal deaths in England and Wales from all causes connected with parturition was about 1 in 230 births. The Dublin Lying-in Hospital reports shew the same thing. Thus in 7 years, ending 1864, there were 8,224 births, with 252 maternal deaths (1 in 32). While, during 1885, for 1,148 cases there were only 9 maternal deaths (1 in 122). While the deaths from puerperal fever last year in Ireland were only 300; that is 70 below the average mortality from the same cause during the preceding ten years.

So in like manner, namely by judicious and persistent sanitary precautions, *trades*, formerly highly injurious to health and life, have been made far less dangerous and deadly.

So, too, *places* and *tracts of land* once very sickly have been made not only habitable but also as sanitary as other parts, by simple common sense precautions. Thus the Campagna near Rome, once so pre-eminently unhealthy that it was practically impossible for anyone to live there during summer and autumn. And a visit to it, except in mid-winter was considered very dangerous, is now converted into a comparatively healthy tract by judicious drainage, vine culture, and the extensive planting of Eucalyptus trees.

The beneficial sanitary influence of improved *dwellings* is likewise reducible to statistics. Thus, since 1867 no fewer than 2,800 houses unfit for habitation have been pulled down in one city, with the result that the death-rate, which in 1863 was 26 per 1,000, is now only 20. With this let us associate another fact, namely, that the amount of disease and the mortality among the working classes, especially the poorer ones, at all stages of life, are very much larger than they are among the middle and higher classes: and that this arises mainly from their more unhygienic surroundings and mode of life; matters which it is the chief aim of sanitary science to remedy.

The hygienic benefits resulting from an improved water supply, and its results on personal and public cleanliness and health, are shewn by the following example. Before the Port

of Marseilles was supplied with water by the Canal from the Durance, its death-rate during the previous ten years (1840-9) was 39·23 per 1,000 of the population. After its completion the average of the following ten years (1850-9) was only 30·60 per 1,000; although, even then, only about 18,000 of its 39,727 houses had a water supply from this source.

But, again, not only is the fatality of disease but also its *amount*, both actual and relative, lessened by wise sanitary measures, public and private. Formerly one-twenty-third of the population was constantly sick; now the number is considerably diminished. When it is considered that for every 25 cases of illness which occurs there is on an average one death, the agency of improved sanitation in decreasing this in a corresponding ratio will be equally apparent to medical men, though, for obvious reasons, not so easy of statistical proof.

Although it would be interesting to ascertain how many persons would have fallen into sickness, and perhaps died, but for these sanitarians, the truest of all benefactors of mankind; the full significance of such facts as the above in their bearing on our national health, and indirectly on our national wealth, commerce and productive power, as well as on our individual well-being and working capability, can hardly be over-estimated. These facts are based on evidence gleaned before and after governments became fully alive to the vital importance of hygiene; and recognised it as much a duty to look after the health of the people as it is to legislate for their political—social —moral and religious welfare.

Instances might be multiplied to an almost indefinite extent of the great influence and efficacy of the all-important and all-pervading art and science of hygiene in improving the health, lessening the amount, intensity and duration of sickness and pain; and prolonging the life of individuals—families—communities and nations: and thus benefiting the entire race in the many indirect ways that flow from these beneficent results. The facts already given, however, are enough to prove that the beneficial results of the sanitary improvements of the last half-century are both general and widespread. Many of the strictly physical ones are intangible and incapable of telling illustration. For example, increased health leads to augmented happiness, improved morality, diminished crime; and to still more important social—moral—and spiritual results, which it would be impossible either to estimate or illustrate. This progressive healthiness, diminution of disease and death, and increased longevity, in so many ranks of life and under so many circumstances, has doubtless several sources. For example, superior modern medical education, improved professional skill and practice: but mainly arises from advanced hygienic ideas,

improved sanitary methods, and more closely studied public and private modes of health-keeping matters—personal—public and national; not only in our individual daily life but also in our schools—hospitals—asylums—public charities—armies—fleets—workshops—factories. And they follow indirectly from the resulting diminished intemperance, lessened immorality, improved food and water supply, more healthy recreation, increased ventilation, improved drainage, cheapened clothing, improved nursing, better care taken of the poor by the rich; increased knowledge and attention both of medical and lay sanitary officers to their duty, and an increased ambition to be healthy and long-lived, arising from a more widespread knowledge that it is in every person's power to be so, if they only will.

But that there is yet room for improvement in sanitation is shewn by this, that statistics prove there is still considerable difference in the death-rate in different cities. Thus in Brighton it was lately 15·3; while at the same time it was 23·9 in Portsmouth; 25·2 in Manchester; 30·3 in Preston. The same thing is shewn by the difference between the death-rate in different parts even of the same city. The same is also shewn by the difference between the rural and urban mortality, for example in the chief town populations of England. Thus in the latter the death-rate (1866) was 18·3; while in the rural population it was only 17·5. And again by the fact that deaths from certain infectious diseases, *e.g.*, small-pox, diphtheria, and fever are still as high or even more fatal in the mainly rural districts as in the largest towns; shewing apparently that in the former sanitation is not yet what it should be and is even now in the largest towns. And also by the simple fact that certain countries and even continents are healthier than others in which sanitary matters are less attended to. Thus, in Russia, where no working sanitary system can be said to exist, the health condition is deplorable. Thus its death in some districts ranges from 60 to 80 per 1,000; of which an enormous proportion is due to mortality among children, which in some places is as much as 79 per cent. of the total mortality. The result is that in spite of a high birth-rate, the population is increasing only at the rate of 1 per cent. So that of the 2,800,000 persons who die annually, something like 1,000,000 may be fairly traced to preventible causes. Further important evidence of the same kind is derived from the fact that, for the same reason, certain communities, and even certain streets and quarters of these are healthier than others, shewing that sanitary science is not so deeply studied, and that hygienic precautions are not yet so complete as they ought to be.

The same great fact is proved by the still greater unhealthi-

ness of certain occupations as contrasted with others, and the evident scope for equalizing these. This will appear from the following table, in which when the death-rate is under 1,000, the occupation is an unhealthy one.

TABLE IV

Death-rate of Occupations

Healthy Occupations	Clergymen		556
	Gardeners and Nurserymen		599
	Farmers and Grangers		631
	Agricultural Labourers		701
	Schoolmasters		719
	Grocers	under 775	
	Coal Merchants		
	Paper Manufacturers		
	Lace & Hosiery Manufacturers		
	Wheelwrights		
	Shipbuilders and Wrights		
	Coal Miners		
Unhealthy	Butchers		1,170
	Plumbers and Painters (lead poison)		1,202
	Filemakers and Knifegrinders		1,667
	Earthenware Manufacturers		1,742
	Costermongers	alcoholic	1,879
	Hawkers		
	Streetsellers		
	Innkeepers	diseased	1,521
	Publicans		
	Spirit, Wine & Beer Dealers		
	Brewers		1,361
	General Labourers		2,020
	Inn and Hotel Servants		2,205

The greatly increased and daily augmenting healthiness which is so soon apparent whenever sanitation is attended to, even in a rudimentary manner, gives the best encouragement for increased zeal, as well as the most likelihood of augmented success. It must be remembered that the great fundamental fact in all hygiene is this: that the reason of the great difference in the amount of sickness and the mortality and longevity among different nations, sections and classes of the community, is mainly due to existing and sometimes completely removeable and remediable sanitary conditions. And that the great practical aim of the art and science, viewed from its broadest aspect is, by removing the one, thereby to reduce the other.

Nor ought the above illustrations fail to amply suffice to prove this great fact that hygiene, both public and private, wherever carefully attended to, is certain, sometimes rapidly but oftener more slowly, to relieve and perhaps ultimately to almost emancipate the entire human race, *if they only would*, from much of the now too frequent pain, sickness and death that sadden life; and to induce increased health, strength, vitality and longevity, both personal and communal; and the many beneficent results that follow in their train.

Every succeeding year will continue to shew correspondingly rapid signs of increased healthiness, wherever the laws of health and hygiene are attended to: and that not in one but in every grade and condition in life; the greatest progress being evident in those nations and cities where enlightened sanitary precautions are most zealously studied and practised; and where sanitation, the most beneficent of all the arts and sciences, is making the grandest strides. Doubtless before the lapse of another century; when God-taught Moses and his Divine Instructor in hygiene and their advice and experience are more closely followed, sanitary science will have so prolonged human life and lessened so many of the existing ailments, both in frequency, force and fatality, that medical men will have not only fewer but also an entirely different class of diseases against which to wage war; older people to treat; and a practice devoted much more towards sanitation than therapeutics. Hygiene, the beneficent art and science by which life is preserved, prolonged and strengthened, is yet in its secular infancy. But no other science and no other department of Nature's great book of the mysteries of life has such great and beneficent triumphs in store for earnest workers: seeing that it has yet so many deep and far-reaching problems to solve; so many secrets to be revealed. To effect this it is essential that we read its facts with our own eyes; reason them out with our own intellect; feel their importance in our own hearts; and, if necessary, devote a lifetime to the study. It is clearly to hygienic attention to the simple, yet imperative, laws of our being that we are to find the long-sought-for and only true "elixir of life," by which we may resist the attacks of disease, the encroachments of age; long preserve the beauty and the pleasures of youth; protect our bodies from early death, and make not only individuals but even the entire race purer—happier—stronger—healthier and longer lived. In the face of facts like these and their self-evident deductions, who can aver that hygiene is a visionary, chimerical, or utopian science, built on the baseless fabric of a dream.

These facts illustrate the utilitarian and far-reaching nature and aim of the science which the Deity first taught the Hebrews

over 3,000 years ago, both didactically and practically; and which through and by that favoured nation and their and our Holy Bible, He has been instilling into and educating us all those many centuries. Who can know or deal better with life, spirit and mind; with the mysterious entities and manifestations of physiological and psychological action; and manipulate the laws and forces of life—health—disease and death, and their correlations, like the God who created and still controls them?

The Future of Hygiene

How perfect we may ultimately make hygiene; how successful we are likely to be in fully carrying out its dictates and attaining its beneficent objects; and whether we shall ever be permitted to completely conquer and banish disease and death; are important questions, though evidently difficult of solution, and still problems of the future. The Supreme has not seen fit in our present state of existence to enlighten us, and perhaps may never permit us to fathom this, one of the many puzzling mysteries of Creation (1 Pet. i. 12; Colos. i. 26; Ephes. i. 9-10; iii. 9). Doubtless some of these are purposely left obscure, because God wills we should not yet know; and others to test our ingenuity and judgment in their discovery or interpretation (Prov. xxv. 2). So also with the secrets of our being; as a result of that intuitive and Divinely implanted desire to know the reason of things, and to probe everything secret, even what is most abstruse and sacred. It is a natural instinct, and therefore Man cannot help speculating regarding these. And mainly does the pre-eminent question arise, why a God of Love should ever have appeared to act like a superlatively cruel Divinity by permitting sin and its results, disease and death, to afflict us? We can scarcely avoid asking if He is ever likely to act like a beneficent one by permitting, aiding or causing their partial or complete removal, thereby fundamentally influencing the health and longevity of our successors.

Viewed from a human standpoint, this World is full of anomalies and contradictions, strangely commingled in apparently inextricable confusion. Nor is this less evident, but on the contrary only the more so, among our own race than amid the teeming lower forms of life everywhere met with in Earth—Air and Sea. View mankind as we may, whether from a moral—social—religious or physiological point of view, we see body—mind—soul and their vital manifestations, assume an infinite variety of phases, thereby producing an incongruous medley of purity and sin, happiness and sorrow, wealth and poverty, pleasure and pain, health and sickness, sanity and mental alienation, life and death. And, as we gaze and marvel, we wonder

whether, in a Creation in which order is one of the first laws (1 Cor. xiv. 33); and Love the main motive power (1 John iv. 8); this chaos and degradation will ever cease. And, above all, whether in place of this superabundant disease—suffering and mortality, lasting and unalloyed felicity will ever again reign supreme as in Eden. Still, on these subjects as with others, such as the health and longevity of the future, our speculations can only be vague and uncertain. Man must not presume to weigh God in his worldly balance or measure Him by an earthly scale. As Galileo worded the idea, we must not "make our knowledge and apprehension a measure of the apprehension of God." God's work, even in one human being; far more in our Planet; and still more in the vast Creation in which Man is as but the small dust of the balance, is beyond the scope of Man's puny intellect. And our main resource under the circumstances is, simply to act like other created beings both of higher and lower rank, and unmurmuringly accept our allotted position, endowments, fate; and do our duty to fulfil our rôle, each in his allotted sphere, acting on the wise conclusion that these and other dispensations of God's providence are somehow or other necessary for our earthly or future welfare; otherwise they would not have been so ordained.

As Parkes writes, perhaps in the scheme planned out for this Earth, God intends that Man, its chief actor, shall never again be as perfectly healthy and happy as Adam in his first sinless estate, nor even attain to patriarchal longevity and immunity from disease. Disease of body, mind, or both, are unquestionably among the crosses Man has to bear through life, the irremediable evils against which he has to struggle, either as punishments or as merciful chastisements to lead or restore him to his heavenly allegiance. But, fortunately, when God removed our invincibility to disease and death, He did not leave us without a health guide to help us to protect ourselves from the afflictions with which the race is now vexed. When the Word of God shall have become universal and its dictates are fully respected; the human body and the rest of the vitalized material Creation will be delivered from the bondage of corruption. And, as we near this blessed consummation we may expect human life to be lengthened, its health promoted, and its vitality perfected. With such evidence before us as pointed out in the preceding pages, no one can reasonably doubt that "afflictions spring not from the dust nor trouble from the ground" (Job v. 6); but come from another and easily discovered source. That, on the contrary, Man makes his own diseases: and therefore that, both as private individuals and as a race we can often prevent them, and thus in a sense hold our fate as to health and life very much in our own hands, as

did the Hebrews of old, according to our observance or neglect of a judicious hygiene. And thus that neither disease nor death need, to say the least, be nearly so prevalent as they now are, but for our own unwisdom.

It is interesting to ascertain what is, was, and what is likely to be the natural limit of human existence; the length of time the body will live under the most favourable conditions and when the fullest care is taken of it. To live as long as we may, and to have as little disease and pain as possible, are duties which the Holy Bible inculcates; and also instincts which Nature's God has implanted in every human breast; although Man often follows very erroneous methods to attain the objects in view. The great aim of hygiene is to promote both of these desiderata. And the first question which meets us at the outset is, what is the greatest possible length of life; and what the highest attainable standard of health that the human race of the present day is likely to reach. Christians naturally ask what does the Holy Bible say on these subjects? The first specimens of the human race were much longer lived than now; their vitality was greater; and they apparently enjoyed better health, that is suffered less frequently from disease; and usually died from pure and extreme old age. For all this there were several obvious reasons: thus—

1st. The race had not become physically degenerate from prolonged subjection to the many deteriorating influences now everywhere prevalent, both in private and public life; some resulting from civilized and others from uncivilized ways, customs, and methods of living; in short from earth-life.

2nd. Their out-door easy life was the healthiest possible.

3rd. Their native semi-tropical climate was the healthiest and most suitable they could possibly have.

We accordingly find that Adam lived to the age of 930 years, while Methuselah of the eighth generation died when 969 years old, the greatest age on record. After him the longevity of the race slowly diminished; but the Scriptures give no clue to the reason of this, except an indirect one (1 Cor. xv. 22); and probably, as in modern days, the sin to which Adam was the first to succumb, and excesses of various kinds to which this, then as now, necessarily led, doubtless was a prominent factor, as it tended to a diminishing vitality; next to a decrease in the Creator's interest in the rebel race, and the supervision of his earthly concerns. Still, Lamech, son of Methuselah, lived to be 777. Noah, son of Lamech, was 600 when he entered the Ark built to save himself and family from the flood which destroyed so many, if not all, of the then limited and localized human family. These pre-Noachian men

were evidently endowed with a far higher and more lasting vitality than the race of the present day; possessed higher disease-repelling, and more of the Vis Medicatrix Naturæ power, enabling them to escape disease better. They doubtless enjoyed the highest health; suffered little from disease; and died mostly from extreme old age or general failure of the vital powers. But the flood was not the only calamity which befel the race in the days of Noah for their wickedness. For the Lord said "My spirit shall not always strive (dwell) with Man, for that he also is (become) flesh; yet his days shall be an hundred and twenty years" (Gen. vi. 3). From this it is evident that the Creator had determined not only to destroy the incorrigibly wicked majority of the race; but also to curtail Man's life. That He meant to effect this slowly and not *per saltum*, and that it was not to include those saved by the Ark, is shewn by the fact that Noah lived to be 950 years, and died 350 years after the Flood. While Shem lived to be 600. When we come to Abraham, however, the ninth in descent, we find his death happened when he was 175; Isaac when 117; Jacob when 147; Joseph when 110; Aaron when 123; Moses, like the Hebrews whom he led, enjoyed special protection from disease, lived to be 120, and died an easy death. For when he ascended (Deut. xxxiv. 7) to gaze on the promised land before God took him, "his eye was not dim, neither was his natural force abated." He was old in years but not in body or mind. Both physically and mentally he was still young, or at least in his prime, and in the fulness of all his vigour.

Subsequently human longevity did not increase or even remain stationary. On the contrary, and doubtless because Man did not improve spiritually, socially or morally, but continued to neglect and contemn God's laws, those of health and life included, he continued to deteriorate physically. God left him largely to his own desires and to his own fate. Solomon, who lived in considerably later times, when the life-shortening influences had increased in number and intensity, gives the extremes of age as "three score and ten, and by reason of great strength fourscore" (Ps. xc. 10), and speaks even of these as remarkable.

Nor does our modern standard differ very much from this. We regard these latter ages even as phenomenal. The great majority of mankind do not live to half that period. However, it has been shewn already that Man is now living longer than he did during the last and even the beginning of the present century. While the above modern extreme age is far oftener reached and even surpassed. Disease is becoming less frequent and severe, painful and fatal. Man, as a race, is becoming healthier and longer-lived, owing mainly to judicious hygienic

measures. These facts amount to an assurance that much more may yet be done to still further prolong our lives and make us still healthier and freer from disease. And judging by the past, every succeeding year and age ought, and surely doubtless will, witness increased progress in both respects, as the science and art of hygiene become perfected and followed out, and God's Word that initiated them is better understood. And some pregnant questions will then, as now, press themselves on our attention. Such as shall we ever be able to successfully cope with and completely banish disease and death? Or, falling short of this, shall we ever again leave Solomon's standard of life behind, and once more regain the 120 years of the post-Noachian period. And, above all, can Man ever again expect to live to the patriarchal ages quoted in Genesis; and enjoy their comparative immunity from disease?

What does Biological Science and its laws say on this subject? The surest and best of all estimates of the probabilities of animal life is the physiological. According to this it ought, under favourable circumstances, to extend to five times the number of years taken by the animal to arrive at maturity. In this Man follows the same law as the lower animals. We cannot say, for the Holy Bible does not inform us, whether Man's growth in this respect was slower than now. However, they were slower in procreating children (Part 4, Chap. 2), begat children at a greater age (Part 4, Chap. 2), and thus had fewer of them than now. Thus Seth was born when Adam was 130. Isaac was born when Abraham was 100 and Sarah 90.

These facts go far to prove that human physiology was considerably different in some respects in those days from now. At present human maturity is not reached till we are over 20 years of age. According to the above estimate, therefore, our full age should be 100. This may be deemed the natural constant of human life; and fulness of age. And no very apparent reason exists why Man should not live twenty years beyond the natural; and on to the prospective term of one hundred and twenty years; especially as this age is not unfrequently reached.

Each human being may be regarded as a very delicate and highly vitalized and organized machine: which, provided it inherits a good original constitution from its parents, might live at least for 100 years, if not longer, provided the individual as a whole, and also any weak organ or part built in and born with it successfully manages to resist the many unhygienic influences apt to attack it at all periods of life; and which come either from without the body or from within its own

structure; or from those accidents of life from which no person is altogether exempt.

But these figures are only the extremes of life; the highest ages to which only a favoured few attain. Statistics prove that comparatively few reach even 100 years. Thus, in the total population of Europe, namely 242 millions, there are only 3,108 centenarians. So that only one person in 77,863 reaches the natural constant of life. Of these it is interesting and perhaps suggestive to notice that the majority are women, in the proportion of 3 to 2; doubtless owing to their less exciting and precarious life. This proportion varies considerably, as will be readily understood, with the healthiness of the race, the country, and civilization. In some only 1 in every 1,000 reaches the age of a hundred; while only 6 in 100 reach the age of 65; and not more than 1 in 500 lives to be 80.

The majority of people born do not nearly reach these extremes of age: for we further find that in Norway the average length of life is only 39; in England $35\frac{1}{2}$; in France 33; and in Ireland under 29. And it has been estimated that of the total number of deaths which happen, one fourth are under one year; one fourth between 1 and 15; one-fourth between 15 and 55; and one-fourth from 55 and upwards. These facts prove that in modern times even the Biblical three score and ten years is not often reached; that it is still seldomer surpassed; and that the mass of mankind die comparatively early in life; the average life of the race being only a fraction of that of their first ancestors—Adam and possibly Eve.

It is pre-eminently worthy of notice for practical hygienic purposes; and an example worthy of imitation by ourselves, because pregnant with such desirable results, that the secret of their longevity has been ascribed by centenarians to various causes: but mainly either wholly or partly to excessive temperance, regular habits, hereditary vitality, freedom from violent emotions, healthy occupations, country life, and moderate feeding. From this it will be evident how much the hygiene of existence has to do with the result. And from a physiological point of view the secret of longevity and perfect health may be summed up as consisting of constant nursing of the vital forces of the body, and opposing the internal and external causes of disease. In other words, by living a life in which hygiene is constantly and judiciously studied success is most likely to be the lot of those who follow these aims most implicitly; other things being equal. And in this mainly lies the reason why feeble folk often live longer and have less sickness than stronger persons. Weakness or poor health, inherited or acquired, enforces constant care of the strength and incessant care of the body.

It is also of importance to know that Pathology has proved that the number who die of pure old age, even among the centenarians and the longest livers, is far smaller than usually supposed. Because the majority of humankind in all climes succumb either to accident or to diseases caused by mental or bodily toil—passion or disappointment. And, compared with other animals, Man dies early, because he is the most laborious and hard-worked of them all; and, alas, likewise the most irregular, intemperate and irritable, three potent factors in premature decay. Man too often either works or worries himself into a sickbed or an early grave. This neglect of the hygienic laws of Nature, leading to so much disease and so many shortened lives, is common to all ages, but especially frequent at the "critical periods" of life, namely from 12 to 17—that is during the passage from childhood to youth, when the body is yet but half formed, so to speak, and undergoing rapid development: the next from 20 to 25, the passage from youth to manhood, when the frame is becoming formed and fully developed: then from 55 to 60, the passage from manhood to old age, when the tissues are beginning the process of slow deterioration which constitutes ageing. During these different stages of life the frame undergoes certain physiological changes, which render the balance of health and life unstable and easily upset; thereby making it for some reason difficult to detect and explain, most apt to be attacked by certain morbific agents and diseases, and these the most frequent and fatal to which the human race is liable.

Furthermore, statistics prove that advancing civilization, with its accompanying hygienic improvements, especially in habits, clothing, housing, and feeding, not only lessens the amount of disease, but also protracts human life. There is not only less sickness; but that which does visit humanity is less destructive than in former times. This shews that the vitality of the human frame is increased both in vigour and in duration in proportion as it is subjected to favourable influences, and the more nearly it is brought into harmony with the laws appointed for its being, and enjoys a suitable environment. And it goes far to prove that mankind may increase the vitality of the race, as he has materially done that of plant and animal life, by judicious self-management and satisfactory reforms. These assertions might be corroborated by many facts, but the following will suffice. The average duration of life in the most favoured class in Ancient Rome (A.D. 200 to 500) was 30 years. Whereas in the present century the average longevity is 50 years. Again, in Geneva the average longevity in the 15th Century was 21 years: whereas between 1814 and 1833 it was

40·68. In Great Britain the average life in 1693 was 26½ years; in 1790 it was 63 years. Most sanitarians agree that the death-rate is capable of being reduced to 15 per 1,000 by the reduction of preventible disease. In that case the mean duration of life would be 54 instead of 41 years. Whilst a reduction to 12 per 1,000 would raise the mean duration of life to 65; 11 would raise it to 70; whilst a ratio of 8 per 1,000, a rate seriously contemplated by eminent authorities, would bring it up to 93. And a fractional amount below 8 would establish the ideal of one hundred years, the sum now held by many to be the normal life of Man.

Still, noteworthy as is this improvement in health and longevity, there is undoubtedly much room for more: and clear that both are still far from what they ought to be, both among individuals and the public at large, especially in certain conditions and directions. This is shewn by the fact that while in one place the amount of sickness is great and the mortality up to 60 or 80 per 1,000; in other places it is as low as 3 per 1,000. It must be evident that sanitary improvement ought to go on till at last the percentages are everywhere as low as the latter figures. And there is no valid reason why, under favourable circumstances, Man should not so order his personal and public hygiene as to live a hundred years. This fact is rendered plain by the circumstance that centenarians are not so very rare nowadays. Thus the morbidity returns of England in 1882 record the death of no fewer than 91 persons registered as 100 years of age or upwards. These included 25 men and 66 women. All animal life, that of Man included, is constituted with vitality sufficient to run it five times the period the particular animal takes to mature. Man matures in about 20 years more or less, according to individual or racial precocity: and ought therefore to live to 100. And if he does not, but dies at an average age, say of 33 or 35, the failure only proves that he has not complied with the conditions of life; and that the lower animals come far nearer to this indispensable compliance. Unlike the unthinking latter, intelligent but unwise Man wastes his stock of vitality and is bankrupt before his term of life is half spent.

Other interesting, important, and eminently practical questions connected with the hygiene of age are these. When does old age really begin; what induces it; and what can we do to retard its approach and oppose its termination? The following are the usual divisions and stages of life.

Infancy	- - -	birth to	2 years.
Childhood	- - -	2 „	10 „
Boyhood	- - -	10 „	15 „
Youth	- - -	15 „	25 „
Manhood	- - -	25 „	55 „
Maturity	- - -	55 „	75 „
Ripeness	- - -	75 „	85 „
Old Age	- - -	85 and	upwards.

Still these figures are not invariable. Some reach these different stages of life earlier and others later, and also linger in them longer, according to various causes, among which we must reckon the influence of heredity and attention to hygiene as the chief. Each human body is born with a certain but varying amount of vital energy: and each person may be said to resemble a chain with a certain number of sound links, but also one or more weak ones. And the vitality and tenacity which holds these different links—organs—and parts of the body together, and makes it either strong and long-lived or the reverse, does not depend on the size, strength or muscular development of the frame nearly so much as on an even balance which the body itself is able to keep between its several parts and organs: a balance which is largely left to Nature's guidance; but is also largely in our own individual control and care. Especial attention is clearly necessary for any individual weak organ; since the vital strength of the body is only equal to that of its *weakest* part.

After mid-age the body begins, as part of the law of Nature, to degenerate; and the vulnerability of its weak spots to become apparent and perhaps urgent; thereby indicating the necessity for increased care. A weakened heart, blood vessel, or other organ or part may hold its entirety and fulfil its function for a much greater length of time if its strength is nursed and no great strain is put upon it. But, on the other hand, neglect of this is dangerous, and often imperils and ultimately ends many a life. Many a slight injury, cold, heat, fatigue, exertion, innutrition, or slight ailment, will often, under these conditions, end a career which might be prolonged indefinitely if this care had been taken; especially as with advancing years the body becomes correspondingly less able to shake these dangerous agencies off than in its earlier years. Man's physical and mental powers seldom begin to fail together. As a rule the former begins sooner than the latter. So that when the physical powers have begun to diminish the mental energies are often at their best. Some of the greatest literary

productions have emanated from men between 50 and 70. And, as in literature, so examples both of living and dead celebrities might be cited, in art, science, philosophy, and politics. But in this increased and increasing age is the augmentation to life, equally distributed over the different epochs? Or do we live longer merely as young—mature—or old persons? Statistics relating to this question shew that by far the larger proportion of the increased duration of human life in England is lived between 20 and 60; that is during the period of the fullest maturity of the body and the brain; physical and mental power, and the most useful and active part of our human career. How much ought not this fact alone to enhance the value of the study and practice of sanitation?

Thus, to sum up briefly what modern physiological and hygienic science thus point out regarding the probabilities of life, is only what the Holy Scriptures long since affirmed; namely, that a much greater age than now prevails is possible. And that the time may and ought to come, and that at a no very distant day, when it shall no longer be mere prophecy but a reality that "there shall be no more thence an infant of days, nor an old man that hath not fulfilled his days: for the child shall die an hundred years old" (Is. lxv. 20). When the great social—moral—and spiritual revolution brings to an end the confusion, iniquity, and misery that now clog our race, and restore increased health and length of days as resulting tokens of Divine favour and partial removal of the Edenic curse; when God shall again walk with Man, shed on him the light of His love, and restore the royalty he lost by his fall. And so also as it has been predicted, "the sinner being an hundred years old shall be accursed" (Is. lxv. 20); one, and that perhaps not the least of the sins which has led to such a sad and inevitable finale, will doubtless be deemed that of persistent neglect of those sanitary laws which God has given us for our guidance; laws which are as imperative and as important for our bodily health as are the Ten Commandments for our soul's welfare.

The very different conditions of modern as compared with those of ancient life; its more artificial and often more effeminate customs; its fast ways; wearing anxiety of the struggle for life; the aggregation of large masses of men in small spaces; and many other new phases of existence; all tend to reduce the standard of health and longevity; and to make hygiene, both private and public, more complicated. But, on the other hand, improved knowledge and increased sanitary zeal do much to counterbalance this; and to make the sanitary results more efficacious and better pronounced; disease and death less prevalent; and life longer than when the Mosaic Code alone prevailed. Modern medical art and science are

already largely preventive and are daily becoming more so. Sanitation is unquestionably rendering a far more important—sacred—and humane office both to the individual and the public at large than sacrætation; although the actual result is not so easily calculated and manipulated by staticians; or the value of the work so easily shewn. The efforts of some of the truest benefactors of mankind, and the issue of their practice, very often cannot be expressed in accurate figures, and can only be shewn by vague generalities. But it must be admitted that the masses are yet far more prodigal both of private and public health than of almost anything else; and that the general interest in sanitation, especially communal hygiene, still falls short of what it should be. Many people, even those who should know better, would sooner take nauseous medicines to cure their diseases and thereby attempt a short cut to health, than undergo the constant care and hygienic avoidance of things which produced their ailment; with a view to its prevention in the future.

But exactly how far we are to be permitted to go in thus successfully grappling with these twin and allied evils of disease and death, and how much we are to be allowed thus to reduce not only the amount of pain and suffering, but also privileged to lengthen human life, so that the patriarchal three score and ten or even the six score of Mosaic times, will not be so rare as they are now, it would be difficult to foretell. Doubtless, as we advance in knowledge and also become more willing to act on Scriptural hygienic advice we may gradually continue to at least in part throw off, as we are now slowly doing, the shackles of disease, like those of sin. And when the Word and Counsel of God shall have become universal, the human body, with the rest of Creation, will be delivered, in blessed consummation from the bondage of corruption. So that ultimately, with a more perfect knowledge of those Divine laws of life and health with which God has graciously surrounded us (complete knowledge being probably unattainable); and more absolute conformity to and complete control over these (thorough conformity and control being possibly beyond our reach), we ought to see the human frame, the mortal body, and the immortal soul, once again in more perfect beauty—vigour—longevity—harmonious proportion—and just balance: once more like those of the great prototypes of our race: and once again in possession of some semblance of the Divine image in which they were originally created. We ought then to see the human frame both longer lived and more free from many of those pains and diseases that now play such havoc in our hearts and in our homes. The day will assuredly come, and evidences shew that it is not far off, when, as we now look back on the Plague,

Black Death, and other diseases of former times, so those who then live will look back on some of the direst morbific pests so familiar to us, such as scarlet fever, typhoid, typhus, small-pox, measles, erysipelas, consumption, cancer, and many other ailments, particularly those latter two fatal and lingering maladies which blight so many a promising life, sadden so many firesides, and kill like consumption, one-seventh of the entire human race. Even now Hygieists are doing much to wipe away the silent reproof of St. Paul that "the whole Creation groaneth and travaileth in pain until now" (Rom. viii. 22).

If this world is ever permitted to see the prevalence of general virtue again, then doubtless sorrow and suffering will also "flee away." It is perhaps utopian to anticipate this great and desirable consummation; or to think that Man can ever make disease disappear entirely. The complete abolition of death is a far less likely event. And it seems more reasonable to expect that to the end of time it will be the fate of all mankind not only to continue to suffer from more or less frequent disease, but also sooner or later to succumb to those forms of sickness or decay certain, one or other, to ultimately carry us off individually. Even when most favoured, God's chosen people, the Israelites, were never, as they never have been since, completely rid of either. And, doubtless, the same cause, namely sin, especially that form of it which consists in the criminal neglect of God's moral, spiritual and sanitary laws, which kept disease and death and their allied troubles among them, will ever continue to perpetuate these among us at the present day and future times, and among the human race generally.

However, if we thus limit, as we are apparently compelled, our hope of complete freedom from sickness, a perfect enthanasia, there is no apparent reason why we should not continue to materially diminish the amount and severity of the pains and diseases which now prevail, and lengthen the number of our days more, as our medical knowledge increases. May not Man reasonably hope from the advances already made, to subdue the physiological as he is now fast doing the physical world; and control the forces of life, as he now does those of matter? So that, as the ages advance, and efforts individual and combined have succeeded in this, we shall at least have made this world a more satisfactory prelude than it now is to the life prepared for us in the "many mansions," and be better able to anticipate the happier future when all connected with our present state of imperfection and discipline shall have ended, and been supplemented by a new dispensation akin to, nay, an advance on that of our first parents before the Edenic fall: when our bodies and our souls will be again unfettered by the afflictions that mar and sadden the present life; and when, our

bodily immortality being regained, disease and death, pain and parting shall have for ever fled, and our condition shall be one not only of holiness but also of healthiness and happiness, perfect and permanent.

But, whatever be the outcome of the hygiene of the future, one thing will appear certain; namely, that nothing of its interest and value can be lost, but much gained, by a study of the hygiene of the Holy Scriptures; especially that of the early Hebrews of the Mosaic era; because it is pricelessly valuable, being not human, but Divine and inspired.

CHAPTER II

FOOD

"Feed me with food convenient for me." (Prov. xxx. 8; Ps. civ. 14; Prov. xxiii. 6; 1 Tim. vi. 8).

We of the present sanitarily-enlightened times possibly do not, but the more meditative among the less erudite Hebrew laity of the Wanderings no doubt did wonder at, because they did not fully understand, until perhaps Moses explained to them, the double meaning, typical and sanitary, of the excessive care bestowed by the Supreme in regulating their national dietary, in a manner and to an extent which perhaps in their ignorance they deemed undue and unnecessary. Fortunately, Jehovah, their real leader, was wiser, and aware how many discomforts and diseases arise among all peoples, ages, ranks, and climes, either directly or indirectly, from faulty dieting and improper food: and therefore legislated accordingly, and thus anticipated their general ignorance and obviated the danger by imposing a wise system that would prevent the calamity of disease; and in other words would, at least as far as dieting could, keep them sanitarily healthy; a matter which perhaps most frequently of all the many unhygienic factors acts malifically on the human frame, usually through widespread ignorance of the fact that diet can be deleterious and even deadly to humankind.

In order to understand why it was necessary to carefully regulate the Hebrew, as it still is the universal human dietary; it will be needful to enter somewhat into the intricate structure, composition, and working of the many-organed human frame; and also into the complex chemical constitution of the innumerable varieties of food with which Nature everywhere supplies mankind in appropriate regional varieties: these being the two factors, both abstruse, mainly concerned in this matter, the maintenance of health or the production of disease. We must, therefore, look into the laws of dieting: a study the importance of which the Hebrews no doubt minimized and neglected, perhaps thinking it unnecessary: conduct in which many concur too much now, and for the same reason. But this was to be one of the most important of the many sanitary lessons the Hebrews were to be taught, not only for their own benefit, but for that of succeeding races, including ours. The Being who

fashioned the human body (Ps. cxxxix. 4) was incomparably the best of all judges as to what was then and still is necessary to sustain it. The Being who forms our food, and also bestows it, has the best knowledge of what we most require (Ps. cxxxvi. 25). Nor ought we to reject his advice (Ps. cxix. 65); for it is instructive (Ps. cxix. 130); and to act upon it is therefore, even from a selfish and a worldly standpoint, the highest wisdom (Ps. cxix. 117).

While the matter that forms the inert inorganic world is marked by comparative physical stability; one of the chief characteristics of organized matter and of beings and things endowed with life is constant change, and a perpetual revolution both in their force, endowments, energies, and particles. This important biological fact is especially apparent in that most highly organized of all Earth's living creatures; that most eminently vitalized machine, Man. The human body, chemically analyzed, is found to be composed of seventeen different elements, namely, carbon, hydrogen, oxygen, nitrogen, sulphur, phosphorus, chlorine, sodium, potassium calcium, magnesium, iron, fluorine, silicon, manganese, aluminium, and copper. The first four exist in by far the largest proportion: those towards the end of the list in smaller and often very minute quantity. Some again are more abundant in some parts, organs, and tissues than in others. In all they are combined so as to form solids, liquids and gases. These again are united to form more complex cells, fibres, tissues, organs, and parts. Again, the body is constantly expending the minute particles of these as waste, in furtherance of its duty and mission as an inhabitant of this world. Hence it follows that their renewal or replacement is indispensable for the maintenance of its corporeal health and life and vigour. To meet this emergency we furnish the so-called *aliments* thus required, in the three-fold form of food, drink, and air.

The first two of these are received into the system by the stomach; the last by the lungs. Thus introduced, they and the latent forces they hold in their grasp, are transmuted by chemical agency, re-combined, re-modified, and applied to widely different purposes. For example:—

1st. For assimilation; to build the fabric up during its period of growth.

2nd. To sustain it during adult life; and keep it up to the normal standard of weight by replacing the worn-out particles constantly thrown off.

3rd. To heat the body and keep it at a suitable temperature.

4th. To supply the stimulus which generates the different vital forces that enable the muscles, nerves, brain, and

other organs to act, and perform their ordinary vital manifestations; every movement, physiological act, and even each thought involving either a waste of tissue or of stored-up food-power.

5th. To furnish material for the secretion of gastric juice, bile, saliva, and other fluids necessary for the digestive and other most important physiological processes.

6th. To make the blood a magazine of surplus material for tissue-making, the elimination of heat, production of nerve force, muscular energy, and mechanical motion.

Food is clearly, therefore, an important and indeed necessary element in our existence: and of great concern both to the strong and the ailing; since health, strength, life, and therefore human happiness all depend largely on it. If the constant expenditure of the particles of the blood and body were not restored thus, our every organ and the body generally would soon waste, become weak, unfit for work, and would ultimately die prematurely. The frame cannot be long kept in health, vigour, or life without food. And it is well to remember that not only is our animal but also our moral character ultimately influenced by our food supply. Roughly speaking, from one-eighth to one-third of the human body in health consists of solid, and the rest of fluid material.

But it must not be supposed that any or every kind of food will accomplish these various purposes. Nor is it, as popularly believed, a matter of indifference what a person eats: since it is by the food that the body is either well, indifferently or badly built up; made strong or weak; prone to disease or the citadel of health. Food is to the individual what bricks and mortar are to the house. Feed a plant badly; give it insufficient or faulty soil, water, and air, and it will languish, droop, and die. So, too, with animals. Indeed by their food we can modify not only their bodies, but also their moral nature. Feed a dog on raw meat, chain him up, and he will become a savage beast. Feed him on bread and milk, and he becomes tame. So, too, with humankind. It is, therefore, mainly the food that makes the Man; and that also which largely determines the kind of individual he becomes, his career, thoughts, actions, animal and moral character, temper, nature, and habits. Therefore, our food greatly influences our physical, and thereby indirectly our intellectual, moral, social, and spiritual development. Thus it has been proved that native tribes who live on sea shores and mainly eat molluscs, become foolish. Others, again, who subsist chiefly on vegetable food, become gentle and lazy. Such as subsist chiefly on meat become savage. Whereas tribes who live on a mixed diet of animal and vegetable food, are neither savage

nor effeminate; but become vigorous in body, intellect, and susceptible of culture. The same rule holds good, more or less, among civilized peoples. And what is true of individuals and tribes, applies to nations. Moreover, the perfect mind requires a perfect body. The reverse is equally true. Both are necessary for the perfect man. Food is necessary for all three. Therefore the question what to eat, what to drink, and what to avoid is an imperative study, and a wise consideration for all, both individually and collectively. And for this, as for many other sanitary matters, it will be seen that nowhere can better advice be derived than that laid down in the so-called laws of Moses.

From all this it will therefore be clearly seen how imperatively necessary it is that our food should possess certain properties; and our dieting carried out after definite principles. These are:—

1. It should be of the best or at least of good *quality*. Healthy blood and strong tissues cannot be formed out of inferior materials. While common sense further indicates that unwholesome food is unsanitary, and apt to engender debility and disease.
2. Our food ought to be sufficiently *abundant*. Both an excess and a deficiency should be avoided; the former being not only a waste of food, but also hurtful to the body, apt to induce various diseases; and the latter likely to cause an undesirable and perchance pernicious loss of flesh and strength. No unvarying law can be laid down as to the quantity we may individually consume, as this depends on age, size, sex, personal peculiarities, work, climate, season, and so forth. For all people moderation is a rule as applicable in this as with regard to every other appetite. The following, however, has been laid down by Dr. Edward Smith as the average quantity necessary *each meal* in temperate climates like that of England:—

	Carbonaceous.	Nitrogenous.
Breakfast - -	6·62 oz.	1·04 oz.
Dinner - -	7·85 „	1·34 „
Supper - -	4·52 „	0·59 „
	18·99 oz.	2·97 oz.
Totals -	21·96 oz.	

Again, Dalton's experiments give the following as the *daily quantity* of food necessary for a healthy man when freely taking open-air exercise:—

Meat - -	oz. 16	
Bread - -	„ 19	$38\frac{1}{2}$ oz.
Butter or Fat -	„ $3\frac{1}{2}$	
Water - -	fl. oz. 52	

Again, the following table by Moleschott is generally adopted as a model daily diet scale. That is, one containing the requisite combination of alimentary principles for supporting life and maintaining health under medium circumstances in a person of average height and weight, exposed to a temperate climate, and undergoing a moderate amount of muscular work.

Solid or Dry Food - -	oz. Avoir.
Albuminous matter - -	4·587
Fatty - - -	2·964
Carbo. Hydrates - -	14·250
Salts - - - -	1·058
	22·859

Water in various forms 50 to 80 fluid oz.

Of this solid food one-fifth is nitrogenous matter. And, since our ordinary food, as consumed, contains about 50 per cent. of water, the above 22·8 oz. corresponds to 46 oz. as we eat it. Moreover 2 lbs. of bread and $\frac{3}{4}$ lb. of lean uncooked beef, contain as nearly as possible the amount of carbon and hydrogen which escape from the body under average circumstances. And it is to be specially noted that this agrees pretty closely with Moleschott's model diet, framed on very different grounds. The chemical composition of this is as follows:—

	Bread 2 lbs.	Lean Beef uncooked $\frac{3}{4}$ lb.	Total.
Nitrogenous matter-	2·592 oz.	2·316 oz.	4·908 oz.
Fat - - -	0·512 „	0·432 „	0·944 „
Carbo-Hydrates -	16·320 „	„ „	16·320 „
Mineral matter -	0·736 „	0·612 „	1·348 „
			23·520 oz.

All such tables, however, though accurate, are only approximative, and not applicable to every individual. And in daily life it is therefore wise for each person to ascertain the average quantity best adapted for his own case: that is the amount best adapted to keep him in health; to enable him to perform his daily work without loss of weight; and to supply the daily waste of the body, no more and no less. In regulating our food thus, attention must be paid to collateral circumstances; and to the amount varied from time to time according to the following factors: *first*, the time from last meal; *second*, the temperature

of the air; *third*, the exertion to be made and work to be performed as already done; and *fourth*, individual peculiarities. We may individually ascertain by observation the precise amount by weight that is necessary to keep the body properly nourished. And when, either by this or by any other easier method, the proper quantity has been found, it should be strictly adhered to. Fortunately, as we cannot all make accurate experiments on the subject, we have each a far simpler and at the same time pretty safe instinctive guide provided in the appetite and sense of hunger, those natural tell-tales which were in operation before means and methods of weighing were invented; and are given to warn us when the body requires food, and when it has had enough. Hence, as a rule, it is wise to cease eating, however tempting the viands, as soon as, or even a little before, the hunger-craving is fully satisfied. Keeping in mind that the more artificial the food, and the more elaborate and luxurious our meals, all the more liable are we to overload the stomach, overtax digestion and the vital forces. As a rule the quantity varies. Some require more than others. Nor does the quantity depend altogether on size, age, or sex. Persons of small frame often eat as heartily as those who are tall or stout. Letheby, however, gives the following as the daily average amount of the two chief ingredients required during inactivity, hard, and active labour:—

	Nitrogenous.	Carbonaceous.	Totals.
Idleness - -	2·37 oz.	19·65 oz.	22·02 oz.
Hard Labour - -	4·56 „	29·24 „	33·80 „
Active Do. - -	5·81 „	34·97 „	40·78 „

Again, during the intense heat and inactivity of summer and of warm climates, the body obviously requires less food than during the cold of winter or frigid latitudes. Men of great muscular energy require more than the sedentary. Again, men eat more, generally speaking, than women by about one-tenth, to make up for greater activity, more work, and consequent tissue expenditure. Adults need more than children: although in proportion to size, the latter and growing people usually consume most, to meet the demands of growth. Thus at ten, children require half as much, and at fourteen fully as much as women. While young men not full grown, but working hard, require more food than women. Working men require more than sedentary or idle people, for an obvious reason. The proportion of the different food elements in an ordinary dietary has been set down as follows:—

Nitrogenous matter - -	1 part
Fats - - - - -	6 „
Starches and Sugars - -	3 „

These are represented with singular exactness in our ordinary dietaries.

3. Our food should consist of *mixed* animal and vegetable matter. Both of these contain the equally necessary mineral element. That it should be neither of these alone is proved by our instinctive desire for either, if that should be withheld. The human teeth furnish another proof, as they consist partly of *incisors* for cutting, *canines* for tearing flesh, and *grinders* for crushing hard food. Our internal physical conformation, intermediate between the anatomy of the carnivora or flesh-devouring and the herbivora or herb-eating animals, still further shews that our proper diet is neither a purely animal nor purely vegetable one, but one that judiciously combines both. Other facts point to the same inference; especially the nature and quantity of loss by excretion; and also the varying chemical composition of our food. And, if there should remain further doubt that Man is neither meant to be purely carnivorous, nor graminivorous, but omnivorous, that is partly both, we have only to turn to the volume which anticipates and decides so many questions; since it shews that Man is not meant to be a pure vegetarian, as some aver (Gen. ix. 3; Acts x. 10). He may be a vegetarian if he prefers it, or finds it healthy: but all kinds of food are permitted; and if he eats flesh, and finds it necessary and salubrious, he does no wrong.

4. Our food should be regulated in *kind* mainly according to season and climate, as has been decided regarding quantity. The body requires more flesh and fat, that is strengthening and heating material, in winter and in cold latitudes; and more fruit, vegetables, and farinaceous food in the summer months and also in warm tropical regions. This is proved by our natural craving for vegetable matters in high and for animal food in low temperatures: and also in unmistakeable language by the clearly providential distribution of both where most required: the natural home of the cattle, sheep, and other domestic animals that supply the one being the cold and temperate zones; while juicy fruits, and vegetables abound most in warm latitudes.

5. Our food should have variety. Too much sameness in dieting makes the appetite clog. Change, on the other hand, is both agreeable and healthy. For example, beef should alternate with mutton, veal,

poultry and such like. And these, again, may be varied by being differently cooked on successive days, and either boiled, roasted, broiled, baked, fried, or stewed.

6. Our food should be eaten as nearly as possible in the form in which *Nature* supplies it. Salting, pickling, preserving, and similar devices, often alter and make it less digestible and nourishing.
7. While we judiciously cook our food so as to make it a pleasure to see before enjoying it, agreeable to the taste and digestible by the stomach; yet our processes ought not to be too complicated. The simplest are usually the healthiest and most promotive of longevity. Moreover, good cooking is not only economical, but also makes our meals both palatable and digestible. On the other hand, bad or indifferent cooking is the reverse; and is doubtless, both directly and indirectly, a cause of much indigestion and many other ailments.
8. Food ought to be eaten at regular intervals, to correspond with the periodic return of the appetite. Instinct, experience, and the general custom of the majority of races, alike prove that, as a rule, three substantial meals a day are best. These should be taken at intervals of four, five or six hours. Because observation has shewn that an ordinary meal is digested and passed from the stomach in four hours. By thus acting this organ is allowed a short rest during the intervals of digestion. Moreover, one of the three meals should be a full one, and the others smaller. The former or chief meal of the day should be taken in the afternoon or early evening. Breakfast should be taken soon after rising on account of the long fasting interval of the night; which, if too prolonged, makes the system prone to pernicious disease-inducing influences, such as infection, miasmata, malific influences of cold, fatigue, &c.
9. Our food should also be regulated in quantity, quality and variety, not only according to differences in age and sex; but also and largely according to trades, professions, and the amount of mental and body work we perform.

Non-fulfilment of any or all of these dietetic laws is not a matter of trivial import, because apt to be followed by serious results. The digestive organs rebel; the elaborately ordained process which they perform becomes faulty: the body droops, suffers, at length succumbs to indifferent health, disease, and even death. Important consequences follow a prolonged

insufficient diet; perhaps the most frequent of all the errors. The minor effects thus produced are often difficult to estimate, because they are often mixed up with those of other unsanitary agencies, as, for example, filth, over-crowding, deficient clothing and fuel, inclement weather, unsanitary houses, poverty, insufficient water supply, light and air. Its major results, however, are more tangible, and consist of failing-health, emaciation, feeble pulse, sallowness, palpitation, giddiness, transient blindness or exertion, mania, apoplexy. *Excessive* feeding likewise has its special ailments. Disease is also apt to follow the ingestion of *unwholesome* food. Hence tainted or diseased food is deleterious. Both the blood and flesh of animals labouring under disease are necessarily diseased also; and therefore unhealthy for food. So also putridity or semi-putridity from long-keeping lessens the nutritive value both of animal and vegetable matters, and make them dangerous to health. And although cooking partly destroys the venom of unwholesome food, there is evidence to shew that much disease is thus occasioned, and no doubt many more ailments of an obscure nature. Disease is also apt to follow a faulty *admixture* or a withdrawal of certain food elements. Thus a privation of vegetable food is an essential cause of the various grades of scurvy and many ailments having a scorbutic basis. Disease of different kinds is also apt to follow neglect of *varying* the food according to the season or climate in which we live; by making it too animal in warm and too vegetable in cold atmospheres. *Irregularity* in dieting is also apt to induce a train of diseases. So also are *complicated* cookery and *unvaried* food. A simultaneous direliction of more than one or all of these factors of judicious dieting is of course still more and also sooner apt to induce indifferent health, sickness, and even serious disease.

This opens up a wide field of thought, which it is impossible to follow here. But one or two examples may not be out of place. For example, an excess of nitrogenous food constantly followed in a dietary tends to induce gout, inflammations, or fatty degeneration of tissue. Lack of it, on the other hand, begets weakness, want of muscular power, and general prostration. If infants are fed on starchy food before the 8th or 9th month they cannot digest it, as then they have no saliva, its solvent. Brain workers need more digestible and less bulky food than muscular labourers.

Clearly, therefore, the selection of our food and regulation of our diet are not matters of indifference. As a rule, each person is, or ought to be, the best judge of the kind and quantity of food, and the meal times, that are best. A good general rule in dieting is to follow whatever is found to agree, and avoid whatever disagrees, especially when the frame is

temporarily or permanently weak. These remarks will also indicate the necessity for an individual study of the general principles of dieting and digestion.

The animal and vegetable food we eat is very different in form, appearance, physical and chemical properties, from the blood, flesh, bone, and other tissues into which it is converted in the body. The process by which it is thus vitally acted on, and metamorphosed into those new forms, is called *digestion.* The first and chief part of this most important function is performed by the alimentary apparatus. This includes the alimentary canal, which again is subdivided into the mouth, gullet, stomach, small and large intestine, and different accessory glands, viz., the salivary glands, liver and pancreas. Our food is first received by the mouth, where Nature has provided a mill, namely the teeth and jaws, by which the food bolus is prepared for digestion by being finely ground and softened and partly digested by the saliva, in other words masticated. The bolus is then swallowed, and descends to the stomach or main receptacle, where it is churned and mixed with the chief digestive solvent, the gastric juice: by from two to six hours contact with which it is fully dissolved and converted into an insipid greyish semi-fluid mixture called *chyme.* This next passes by degrees into the small intestine, where it is mixed with two other special secretions, namely, bile and pancreatic juice. These convert it into another fluid called *chyle,* which soon separates into three distinct parts, viz., 1, a whey coloured fluid; 2, a creamy layer; and 3, a sediment. The process is then complete. The former two, which form the nourishing parts of the mixture, are then absorbed as they pass along the small and the large intestine. The remainder is the innutritious and undissolved refuse which passes on.

From all this it will be apparent that the human body, which consists of so many different chemical elements variously combined and grouped so as to form the numerous organs and tissues of which it consists, secretions and excretions which it makes, and functions it performs, is being constantly expended and wasted by our ordinary bodily energy; the resulting detritus or waste products being thrown off by the different excretory organs (lungs, skin, kidneys, liver, bowels, &c.): and, therefore, have to be as constantly and fully replaced and reconstructed. These processes have to be effected by our food and digestion. But, again, the food, like the frame to which it furnishes material, is also very complex physiologically, chemically and physically. Thus the different chemical elements found therein primarily and principally exist in the shape of animal, vegetable, and mineral compounds; which are best studied as consisting of two varieties of matter, viz.—

1st. The nitrogenous or protein-yielding compounds, which consist mainly of carbon, hydrogen, oxygen, and nitrogen; ; usually combined with small quantities of sulphur and phosphorous. These are found variously combined in the animal frame; and thus form such substances as the following:—

a Albumen and fibrin, like that found in white of egg.
b Gluten, " " flour
c Gelatine, chondrine " " gelatinous matter
d Legumin " " peas and beans
e Casein " " milk
f Globulin " " blood
g Myosine " " muscle

The duty of these is to act as 1st, flesh formers; 2nd, tissue repairers; 3rd, heat generators; 4th, energy or force producers; 5th, oxydizers for chemical combustion with the effete tissues.

2nd. The non-nitrogenous. These consist of four sub-groups, viz.:—

a Starches, amyloids or carbo-hydrates, sugars, gums, alcohols, and some vegetable acids, such as lactic and acetic. These are heat-producers.

b Fats and oils, or hydro-carbons, which are also heat producers.

c Minerals, *e.g.*, iron in the blood, lime in the bones; phosphorous in the brain; and salines in the secretions.

d Water, the most important of all foods, as it forms two-thirds of the weight of the body; 80 per cent. of the blood; 80 per cent. of the brain, and even ten per cent. of bōne; and is being perpetually given off by the body, especially the skin, lungs, and kidneys; its main use being to form the secretions and excretions; to assist in removing waste products; to dissolve and convey other foods through the system; and to regulate the bodily temperature by cutaneous secretion and evaporation. The importance of water to the human body is shewn by the fact that if deprived of food and water a man may live only six or seven days, whereas if water is allowed he may live 60 days.

It will, therefore, be apparent why no alimentary substance can prove a satisfactory kind of food, and satisfy all the requirements of life, that does not possess in its chemical composition and in full proportion all of the seventeen elements already enumerated; because it is from these, combined as organic products or *alimentary principles*, that the various constituents of the body composing the many different tissues, organs and cells are derived, and its different parts are kept up to the normal standard of size and energy. Our ordinary food, as selected by instinct, custom, common sense and science, thus consists of different ingredients variously combined to form special compounds, each having its own definite and often very different use and purpose in the human economy. Thus the albuminous repairs the muscles, supplies them with motor power, and helps to heat the body. The fatty, also supplies motor power, and is the chief heat-producing agent. The saccharine and starchy help to generate caloric and force. While the water and the salines assist the others. All of these should be present in our diet, since none of them can singly sustain life. So also, articles of food deficient in one thing should be associated with such as have an excess; *e.g.*, milk, butter, or cheese with bread; butter and oil with fish, and so on. Every dietary should have vegetables. Combinations like these aid digestion. The proper proportion of these different constituents necessary for a healthy man of average age, size, and weight performing a moderate amount of work, is thus calculated by Letheby:—

	Avoirdupois.	As per centage.
Nitrogenous substances -	4·587 oz.	22
Fatty „ -	2·964 „	9
Saccharine „ -	14·257 „	69
Saline „ -	1·056 „	—

These, the different secretions of the alimentary canal are meant to dissolve, transform, and *digest*. The gastric juice is the primary principal and general solvent; further on the pancreatic juice acts on the sugary and starchy particles; the bile dissolves the fatty and oily food: the saliva aids both the gastric and pancreatic fluids. None of these secretions can entirely fulfil the function of the others. And, therefore, if not mixed properly with these alone, food containing any or even all of the four above-mentioned constituents is likely to pass through us undissolved and undigested, or only partly so.

Digestion is a vital process, partly mechanical, but mainly physiologico-chemical. Chemistry is one of the most wonderful of the sciences; and chemists can do strange things with different chemicals. For example, they can convert one substance into a totally different one; solids into fluids or gases;

these again into the former; and so on. But no earthly chemist can equal, far less excel, the marvellous physiological chemistry which is constantly, silently, and spontaneously going on throughout nature; and nowhere more persistently than in the human frame, especially in the process of digestion, and during the conversion of food into different bodily tissues and organs, secretions and excretions. No earthly chemist can convert vegetables into milk; milk into brain or muscle; bread into flesh; flesh into blood or bone; and all of the different articles of man's ordinary food into the many distinct and diversified tissues and organs and parts of which the human body is composed. Above all, no earthly chemist can transform inanimate matter into *living* tissue; or cause it to produce startling *vital* actions, such as muscle contraction, nerve force, thought, and so forth, results all so difficult to explain. And yet the chemist's own body, or yours, reader; nay, each individual cell and fibre in it can do all this silently and thoroughly. Thereby proving that Nature's, that is God-created and Heaven-directed, far surpasses our best human and chemical science; and performs feats in physiology that Man himself, however gifted and highly educated, cannot accomplish.

Like all complicated chemical operations, however, digestion, one of the most complex of them all, is easily deranged, and requires great care and nicety of adjustment. Otherwise, the completed physiological result is unsatisfactory. It ought ever to be remembered that it is quite as necessary to attend to the mode of eating, the quantity, and the frequency of our meals, as it is to think of the kind of food we use. And we find that, with singular appropriateness, it is chiefly against errors of this kind that the Holy Scriptures warns. But the full force of the Scripture health hints regarding food and dieting, now alluded to, will be better understood if we first point out what happens when the delicate requirements for healthy digestion, already hinted at, are not fulfilled. These take the form of another series of ailments, types of discomfort, and failing health. Thus:—

1st. If food is hastily, and therefore insufficiently masticated, and is "bolted" almost entire and unchewed, the hard angular lumps are apt to bruise and perhaps lacerate the soft and very delicately constructed mucous membrane lining the stomach, a result obviously detrimental both to that organ and the digestive process.

2nd. Hasty mastication, moreover, means imperfect admixture with saliva; and half digestion of the starchy and sugary food, which is thus not only wasted practically, but also apt to cause irritation; while the body may

also suffer through deprivation of a special ailment. Nor can the fluid gastric juice penetrate lumps of food: so that only their outer surface is dissolved, while the remainder is practically wasted; a matter in itself of small importance but for the fact that it now becomes apt to irritate, gripe, and even cause serious disease as it passes down.

3rd. As the quantity of saliva, gastric juice, bile, and pancreatic fluid secreted in health is generally only sufficient to dissolve the food which the body requires or can absorb; it follows that if more food is eaten at one time than is necessary; or if we feed too frequently, or again if we partake too freely of any particular kind of diet, the excess is not digested, but is wasted, apt to decompose, cause irritation, indigestion, and various other ailments. While the body may in addition absorb, and ultimately become loaded with imperfectly assimilated materials, not only ill-adapted for secretion, tissue-making, and so forth, but also likely to cause blood plethora and other ailments.

4th. If by eating too often we add fresh food to that which is already half-digested, the entire process is likely to be interrupted, and various irritative ailments induced.

5th. If highly irritating food, for example, spiced, pickled, or salted, is eaten too freely, the delicate lining membrane of the alimentary canal, especially the stomach, is apt to congest or inflame, a fruitful cause of indigestion and other diseases.

6th. If the gastric juice, saliva, and other secretions are suddenly and largely mixed, and thereby over-diluted with water, by copious drinking of watery fluids, they cannot properly dissolve the food: the resulting chyme being irritative, and unfit for absorption or nourishment.

7th. If, while digestion, that requires a stomach temperature of blood-heat (98° to 100° F.) is in progress, too much iced water, or cream, wine or other cooled fluids is taken, the process is apt to be interfered with or even stopped; and indigestion or other ailments induced by the sudden and great reduction of temperature, amounting perhaps to from 40° to 70° Fah.

Clearly, therefore, human digestion and bodily nutrition may be thus disturbed in various ways. Clearly, therefore, we must attend as much to *how* as to *what* we eat. But by nothing does digestion oftener, more surely, or more severely suffer than by loading the stomach with superfluous food. When this happens every one of these physiological requirements is apt to

be ignored. Nature has kindly permitted us to enjoy eating. But, as with every other desire, it is clearly necessary in gratifying taste and appeasing hunger, to exercise our individual judgment and self-control; and neither indulge too freely in dainties, that is hurtful articles, however enticing, nor even in ordinary kinds of food. It is truly marvellous, considering the delicacy of the process, and the little attention that is often, perhaps usually, given to our dieting when we are in robust health, how Nature carries on digestion so long and successfully as it often does. Non-professional minds can scarcely credit the enormous amount of disease caused by faulty digestion, arising sometimes from faulty construction or imperfect function of the digestive organs; but far oftener from disordered processes originating as already mentioned. As it is, if constant attention of the kind here indicated were given by each individual to his dieting and to the subsequent physiological process of digestion, an enormous saving of pain, discomfort, and sickness would undoubtedly result. Even a single disregard of any one of the necessary conditions for its healthy performance may cause embarrasment and illness, especially when the stomach is naturally weak. And a host of more serious and lasting maladies are indirectly occasioned by a persistent continuance in the evil habit; in which every organ, function, and part of the body may ultimately become involved, especially the kidneys, liver, skin, and other excreting organs. And it is well to remember that it is not only those of naturally puny frame and weak digestion which may thus suffer by a continued neglect of this important function, but the very strongest. No one escapes, even those who take constant care.

The necessity for careful observance of the obvious rules of dieting and digestion, especially that enforcing deliberate, slow and thorough mastication, is of especial value to busy nations, like the Anglo-Saxon and its offshoots; and busy communities where "time is money," and meal times apt to be unwisely curtailed. So also is that regarding change of diet according to temperature, in those regions where, as for example the Eastern States of America and similar regions, the difference between summer heat and winter cold is great. While the rule regarding regional dieting is equally important in countries like America and the various widespread possessions of the British Empire, the territories of which lie in all three, the torrid, frigid, and temperate zones: between which extremes of heat and cold, active citizens are constantly making rapid interchanges by travel for amusement or for business.

The Holy Scriptures give very frequent and important hints regarding these most important sanitary factors, food and dieting. The greater and by far the most important part of the

hygiene of food found in the Bible, is met with in the specially Hebraic portion, the Pentateuch. This consists mainly in advice regarding the judicious provisioning of the nation; especially concerning the kind of food Jehovah desired them to eat; a subject into which it enters with considerable minuteness, thereby pointing out its sanitary importance as the fundamental factor in the matter of dieting; not only to individuals but to nations and the whole human race.

The Hebrew Dietary

Man at first was probably a vegetarian (Gen. i. 29). This rule was, however, repealed after the Flood, when animal food was also permitted; a new law being enunciated to Noah 850 years before the Exodus, "every moving thing that liveth shall be meat for you, except blood" (Gen. ix. 3-4).

In Egypt the Hebrews had a mixed diet, and when they left could not forget their "flesh pots" (Ex. xvi. 3); and their cucumbers, leeks, garlick and bread (Numb. xi. 5). At the Exodus they took their flocks and herds (Ex. xii. 32); unleavened dough (Ex. xii. 34); and such things as they required (Ex. xii. 36). This clearly included provision enough to last for six weeks; that is until the 15th day of the 2nd month (Ex. xvi. 1), when they came to the Wilderness of Sin. Here they murmured for food, which had evidently failed (Ex. xvii. 2), and so were miraculously supplied from Heaven for the rest of the long Wanderings, in the form of Manna, and occasionally quails: with possibly corn and vegetables grown in their lengthier campings, *e.g.*, at Kadesh. Manna, however, was their chief food, which they gathered every morning for six days, and on the sixth enough for the Sabbath.

When Jehovah took in hand to educate the Hebrews, and added sanitary science and practice as a very important part of his curriculum, this necessitated the bequest of a dietary, especially for the selection of animal food; and fitted not so much for the desert as for their future career in Judea; where, on leaving Egypt, they expected to be soon. This Dietary and Dietetic Rules are found in Leviticus and Deuteronomy: where they form part of the sanitary code given the Hebrews by Jehovah, to promote health not only when massed in camp, but also when more widely scattered over the Promised Land: and which again form an integral part of the larger and more comprehensive Sinaitic or Mosaic Code. In this the permitted or clean, and the disallowed or unclean forms of animal food are carefully defined and meant to be strictly followed.

The Hebrews soon found out after crossing the Red Sea and

becoming a free nation, that food is essential for comfort and even life. This initiated a lesson in faith; and was their first in dietetics. But their leader, Jehovah, knew more, and could see further; and desired to give special tuitionary importance to this particular department of hygiene. He was aware that a wise selection of food is necessary for health; that food was to them exactly what it is to us, one of the most important items both for preserving health and preventing disease: while injudicious dieting is exactly the reverse. Give a child, youth, adult, family, community, army, or nation an abundance of healthy food, and it will become and keep vigorous, clear-brained, happy, and long-lived, other things being equal. Give it inferior, improper, or deficient food, and the reverse will follow. Hence why, in accordance with this, the Israelites had an abundance of Divinely-appointed and therefore wisely-chosen and physiologically suitable, food in the Desert; and a good selection for their final goal and home, Judea. Hence it is also why we find fuller and more explicit hints regarding food and dieting, especially as to kind and variety, in the Pentateuch, than anywhere else in the Bible. Jehovah was then legislating for and teaching the Hebrews, and the World, by that most important series of law codes, the Sinaitic; a summary of human hygiene in which body sanitation formed a most important item, and a matter of such prominence as to warrant its creation into a special code.

The following is a list of the chief Hebrew dietetic articles; including those for the Desert and for all times. Our review will be directed 1st, to their animal; 2nd, their vegetable; and 3rd, their condiments.

(TABLE V)—

TABLE V

List of Clean and Permitted, and Unclean and Disallowed Animals in the Mosaic Dietary

(Deut. xii. 15; Deut. xiv.; Lev. xi.)

No.	Species.	Clean and Permitted for Food.	Unclean and Forbidden for Food.
1	Quadrupeds or Mammalia (Lev. 11. 27)	Cow, Ox, Sheep, Goat, Do. wild, Hart, Roebuck, Fallow-deer, Bison(Pygarg), Wild Ox, Chamois — All hoof-parted cloven-footed two-clawed and cud-chewing (Lev. 11. 4)	Camel (incomplete H. div.), Coney (Jerboa or Wabber), Hare — Cud-chewers not hoof-divided (Lev. 11. 5-6); Swine — Hoof-div. but not cud-chewers (Lev. 11. 7-8); Whatever goes on all fours or paws (Lev. 11. 27); Weazel, Mouse, Ferrett, Mole — Smaller animals (Lev. xi. 29)
2	Birds or Bipeds. (Lev. xi. 13-19).	Doves, Quails, Fowls, &c., &c. — All vegetarians with savoury flesh.	Eagle, Ossifrage, Ospray(Glede), Vulture, Kite, Raven, Owl (Ostrich), Night-hawk, Cuckoo, Hawk, Little Owl, Great Owl, Cormorant, Swan, Pelican, Gier Eagle, Stork, Heron, Lapwing, Bat — All Carnivorous
3	Fish (Lev. xi. 9-10)	All having fins and scales, non-carnivorous, sea-weed eaters. Flesh wholesome, nutritious, edible and palatable.	All without fins and scales, *e.g.*, the Shark tribe, Dog-fish, &c. (Lev. xi. 10). Usually carnivorous, voracious, flesh of coarse fibre and unsavoury.
4	Insects (Lev. xi. 2-23.)	Locust, Do. (bald), Beetle, Grass-hopper — All with leaping legs above their feet.	All flying creeping creatures on all fours mostly forbidden, and carcase deemed unclean.
5	Reptiles (Lev. xi.)		Serpents, Caterpillars, Worms — All going on their belly; Crocodile, Lizard, Tortoise, Chameleon — or on all fours; Centipedes, Millipedes — Many-footed.
6	Molluscs. (Lev. xi. 30).		Snail.

1. The Hebrews were forbidden to use certain animals for food. Thus:—

"This is the law of the beasts and of the fowls and of every living creature that moveth in the waters, and of every creature that creepeth upon the Earth; to make a difference between th unclean and the clean; and between the beast that may be eaten, and the beast that may not be eaten" (Lev. xi. 44-47). This law applied to the animals tabulated in Table V. That this is not merely a local law adapted for the edible animals of the Hebrew lands of that period, but one of vast, and indeed world-wide embrace, is clear. This Sinaitic or Jehovistic law may, and indeed should be, followed go where we will on Earth. Singularly it is that which, broadly taken, is followed when possible, by all nations, savage and civilized, Bible-gifted and Heathen. It is that which popular human instinct, experience and taste, have marked out for themselves; and long selected or discarded for dietetic purposes. And the list, which in the Mosaic dispensation was deemed unclean and so forbidden, is that which in the new or Christian dispensation is practically judicious and suitable for mankind in the main. The old Mosaic law of animal food selection, over 3,000 years old, is therefore still consistent, far-seeing, universal, and time-lasting. It is, therefore, worth study even yet. The lists in Leviticus and Deuteronomy differ, but that mainly in the former having only general rules laid down, illustrated by a few examples; whereas in Deuteronomy special animals are mentioned.

Both of the lists in Table V; that of edible and that of non-edible animals, include the entire range of the animal kingdom; and comprise names from all of the four great primary divisions; both in the list of "clean" and "unclean" quadrupeds, birds, fishes, reptiles, insects and molluscous animals. Those forbidden were to be strictly avoided. These lists, like all that is Jehovistic, are very brief, yet comprehensive.

In this Mosaic list (Table V) the edible or "clean" quadrupeds, eleven in number, consist altogether of such as are hoof-parted, cloven-hoofed, and cud-chewers. One or even two of these three requirements were not enough. All three were necessary These consist mainly of the domesticable animals; those of the flock, herd, and farm-yard; all vegetarians, graminiverous or grass eaters; with savoury edible flesh. A few wild varieties are included. It is not easy to account for the exclusion of the camel and hare. Camel's flesh and milk were used by the Arabs. Probably this animal was too valuable to kill. Hare was eaten by the Egyptians, and was long supposed to ruminate. The horse and ass were also spared, probably for the same reason as the camel. Many of the restrictions were arbitrary or based on usage. The Mosaic law

practically left among the permitted meats an ample variety; and no inconvenience was likely to arise from a prohibition to eat camels, horses, or asses. Moreover, in Eastern countries there was usually so little animal food eaten on common occasions; its use being generally confined to festival days, that these restrictions were not burdensome.

The permitted or "clean" birds are not enumerated; but from the list of "unclean" bipeds we may glean that, like the quadrupeds, they include the vegetarians and the graminiverous which live chiefly on grains or grass; and whose flesh is savoury. So also the "clean" or permitted fish, those having fins and scales, include the non-rapacious or vegetable, that is seaweed eaters; whose flesh is wholesome, nutritious, edible and palatable. Some, like Ritter, think that fish may have contributed materially to the sustenance of the Israelites in the Desert (Numb. xi. 12). Edible fish is particularly valued in Egypt during the hotter season. The edible ones in the list include the most wholesome varieties, except the oyster. But the Mosaic law probably refers back to the produce of the Nile in past days; instead of forward to that of the Jordan, its lakes, and the Mediterranean of future times. The Egyptian Priests were forbidden to eat fish of any sort; because it was supposed to increase the sexual appetite, and to cause or aggravate leprosy.

No reptiles were permitted for food; all being deemed unclean and unfit. The permitted insects also included the graminiverous or vegetarians; *e.g.*, the locust, grasshopper, and beetle, "with leaping legs above their feet"; *i.e.*, with long hind kangaroo-like legs. Insects of this kind were much used as food by the poor in some countries.

No molluscs or shell-covered animals were permitted as food.

On the other hand, the forbidden or "unclean" quadrupeds mentioned are eight in number; typical no doubt of many more of the same genera. The chief ones were those that were not hoof-parted, cloven-hoofed, and cud-chewers. The absence of even one of these made an animal unclean. They included the camel and hare; probably for the above reasons. Swine, so often eaten now, were prominently forbidden; no doubt from a sanitary aspect. Swine are notorious scavangers of filth. Those we eat now are, or ought to be, only such as are fed on meal and wholesome vegetables; a kind of feeding probably, for various reasons, difficult in the Desert. Besides, to keep and drive herds of this obstinate animal would have been cumbrous and insanitary. So their culture was discouraged. Moreover, they are peculiarly liable to disease. Eating swines' flesh tends in Syria and Egypt to produce *measled* (*i.e.*, very dangerous) pork, as no doubt it also did in Mosaic times. Foul feeding,

especially in warm countries, where decomposition is rapid, is apt to hasten putrefaction, and render the flesh unwholesome, and thus make it pathologically more mischievous than in colder latitudes. Among the smaller animals forbidden the edict against mice for food aims against certain idolatrous practices then prevalent.

The forbidden birds were all of a more or less similar kind; inasmuch as they were predatory, carnivorous, living on offal and on dead or putrid matter; not over sensitive as to its selection: all having flesh which is rank, unsavoury, more or less tough, indigestible, and unfit for human food. And, also, possibly from this unclean feeding, more liable to enteric parasites, which may be transmitted to those consuming their flesh. The Raptores among birds are eaters of flesh and fish and are also the natural scavengers of cities and streets; and devour all sorts of obnoxious food; a habit which begets an instinctive repugnance towards them; and associates them with defilement, and its sources. The lacustrine birds are also impure eaters. The nocturnal birds are carnivorous, insect-eaters, and impure feeders.

The forbidden or "unclean" fish also included the fin-less and scale-less voracious, carnivorous and predatory kinds, with flesh which is of coarse fibre and unsavoury; such as the Shark and Dog-fish. These are now eaten only, or usually only, by uncivilized tribes.

All insects, with the following peculiarities, creeping on all fours, were mostly forbidden. All reptiles, including the many-footed, *e.g.*, the centipede: those which go on all-fours, *e.g.*, crocodiles: and those progressing on their belly, *e.g.*, serpents; were also forbidden as food.

Molluscs, including the snail, were likewise "unclean" and forbidden.

Thus, as a whole, the permitted or "clean" animals, in the lists; both of sea, land and air; including the quadrupeds, bipeds, reptiles, insects and molluscs; were such as were vegetarians or grain-eaters (graminiverous) and mostly uniparous: while those that were forbidden and "unclean" were the predatory or flesh-eaters (carnivorous) and mostly multiparous. The flesh of carnivorous animals is always rank, unwholesome, and subject to parasites.

All of the "unclean" animals named were an "abomination" (Lev. xi. 9-12); and were on no account to be eaten. "Ye shall not eat any abominable thing" (Deut. xiv. 3) was Jehovah's command to the Hebrews. The Creator is an infallible naturalist, and knows better than any skilled scientist among us on what different animals feed. And is also the best of biologists and pathologists to know and expound how faulty

impure animal food may make their flesh, and inferior or unfit for human food. He can and therefore has selected accordingly; and has done this better than we could ever do; and thereby anticipated human teaching by many centuries.

On the whole, though the scriptural zoological arrangement of animals, evidently that of Jehovah is correct; according to our modern ideas; a few exceptions may be mentioned. Thus he includes the Bat among the birds, no doubt because it flies. Whereas we, for anatomical and biological reasons, class it among the Mammalia. Again, he classes caterpillars, worms, centipedes, and millipedes among the Reptilia, no doubt because progression is by creeping. Whereas we class them among the Insecta.

Commentators, and even skilled zoologists, differ considerably concerning the exact nature of some of these Bible animals, no doubt mainly from faulty translation and indefinite knowledge of the natural history and animal names of that early day. But we know much that is both certain and interesting regarding both the "clean" and "unclean" varieties. Many facts regarding both classes and the individual animals in both sections are well authenticated, and are both of interest and importance in connection with the dieting, health, and sanitation of the early and later Hebrews. There is assuredly some basis for the belief that, as with the lower animals, so with Man, their instincts, habits and nature are materially influenced, modified and moulded by the kind of food on which they subsist; and as to whether this is mainly animal or chiefly vegetable. Although we may not carry the belief so far as to aver that, like animals, we fully acquire the instincts and habits of the animals on whose flesh we live; thereby partially or wholly discarding those of our own species. Still, does not over-feeding on animal, to the exclusion or minimizing of vegetable food tend to induce love of discord and fighting rather than peace and industry; and also greater disregard of cleanliness and morality? The Hebrew dietary was selected accordingly. We shall see that it was largely vegetable; and that their selection of animal food was curtailed, in accord with the above idea. The Hebrews were brave when required to be so; and especially so as they knew and believed that in a right cause Jehovah backed their valour. But they were not meant by their Divine leader to be a fighting or world-conquering people, by aid of war. Their spiritual, moral, and social training was of a different nature. And they were dieted in accordance with this: not as gladiators, but as agriculturalists and shepherds. Had the free will of the Hebrews been amenable to Heavenly advice and Divine aid, they would have developed into the dominant nation of the world; the leader and teacher not only in spiritual, moral, social

and political, but also in sanitary matters, dieting included. With a view to accomplish this beneficent end they were led and fed accordingly, and indoctrinated with wise, spiritual, moral, social, political, and *sanitary* ideas, and instructed regarding as well as dieted with special and appropriate physical food and a judicious dietary. In their early days they had many wars and much fighting; but victory came by Jehovah and through Divinely-instilled fear on their enemies; so long as their wars were carried on in furtherance of the Divine plans. Their subsequent wars as an errant nation were in every way different, both in conduct and result.

Among the "clean" or permitted food animals the Hebrews might consume were the

Cow and Ox. The domesticated cattle of Palestine and Egypt differ very little from our own; and were very valuable, owing to their threefold use, viz., sacrifice, agricultural labour, and food.

Sheep. Flocks of these formed the chief wealth of the Hebrews. This and especially the Lamb is and has been from Abel downwards, pre-eminently the sacrificial animal.

Goat. This forms part of the Hebrew and the Patriarchal wealth; and is used in sacrifice, for food, and its milk, which is an important article of diet.

Goat (Wild). The Arabian Ibex, allied to the Alpine variety.

Hart. Deer abounded in Palestine; its flesh is delicate.

Roebuck or Gazelle: which goes in herds often of a hundred, and abounds in Palestine.

Fallow-deer. A species of Antelope; the Bubale or wild cow of the Arabs.

Chamois; or wild Mountain Sheep; familiar to the Hebrews in Egypt.

Quail. A small species of migratory partridge, with delicate flesh.

Dove. This is the only bird offered in sacrifice. Wild and tame species are plentiful in Palestine, and the first the Hebrews domesticated.

Fish. No particular kind is named either to use or avoid. Barbel and Bream were the most common fish in the Jordan and Sea of Galilee. Large quantities of salted fish were used. Originally derived from the Mediterranean. Fish was largely eaten in Egypt; perhaps in the Desert: certainly in the Promised Land.

Locust; *Bald Locust*; *Beetle and Grasshopper*; also the Palmer-worm and Canker-worm are probably only varieties or different larval stages of development of the Locust. All of these are grain feeders or other pure human food. They them-

selves form a palatable food, largely eaten by the Hebrews.

Again, among the "unclean" or forbidden animals were the

Camel. Costly, because the most valuable animal for burden, draught and riding. It was used as food by the Arabs; but only its milk by the Hebrews. Its flesh, though edible, was unsuitable for food, being rank in smell, hard, and unwholesome.

Coney. The Hyrax or Rock Badger; a rabbit-like animal, but neither ruminant nor rodent; and of the Hippopotamus or Rhinoceros genus.

Hare. A rodent, not ruminant, of which there were two species in Palestine, the Syrian and Egyptian. Early medical writers aver that its flesh causes thick and dark blood. The animal is said to have most debased instincts, and to become increasingly impure as it ages.

Swine. This animal is regarded by the Hebrews with special aversion as the most unclean of all the "unclean" animals mentioned by Moses: as it is of dirty habits, very unscrupulous in its feeding, apt to engender "swine fever" and other infectious ailments, and its consumption to cause skin diseases. It is impossible to keep camps or cities clean where it is kept. According to a general medico-Jewish belief its milk produces or predisposes to leprosy. If measly (and in the early stages this is not easily discovered) it is apt to cause tape-worm and trichinosis. The swine's life is said to resemble that of the lower class of human beings. Example, even from the lower animals, is to a certain extent contagious.

Mouse. This is a generic term, which includes not only the ordinary mouse but any small rodent, *e.g.*, the Rat, Dormouse, &c., a class of which Palestine has 23 species.

Ferret. This probably means the Lizard (Lev. xi. 30); or the Gecko.

Mole. This probably means a kind of Lizard (Lev. xi. 30), or any kind of burrowing animal, *e.g.*, the Rat or Weasel. Moles are unknown in Palestine.

Eagle. The Griffin or Bald-headed Great Vulture; a carrion eater and the foulest feeder that lives; hence one of the best of scavengers, though unfit for human food.

Ossifrage. The Bearded Vulture or Bone-breaker ("lammergeier"); the largest of the vultures; carnivorous and predatory.

Osprey (Glede). One of the smaller Eagles; piscivorous.

Kite. Probably the Falcon (Deut. xiv. 13) or black-winged Kite; piscivorous.

Raven. This name includes all birds of the Crow family. Ravens are numerous in Palestine, and of many kinds.

Owl. This is probably the Horned Owl or Swan or Ostrich

or Night Hawk (Lev. xi. 16). The flesh and eggs of the Ostrich are indigestible and unwholesome. The Arabs sometimes eat the young bird.

Little Owl. This is the most frequent Owl in Palestine.

Night Hawk. Some say this means the Ostrich; others the Egyptian Horned Owl; others the Barn Owl, which is as common in Palestine as in England.

Cuckoo. Some think this means a species of Sea-gull. But there are two species of Cuckoo in Palestine.

Hawk. This means the Kestrel and all smaller predatory birds.

Bat. Its haunts have an abominable stench: like the animal itself.

Great Owl. Palestine has various species of Owls, especially the Little Owl.

Cormorant. A sea-bird; long-necked, like the Pelican.

Swan. This probably means the Ibis, a sacred bird of the Egyptians.

Pelican. A sea-bird, which preys on fish.

Gier-eagle. The Egyptian Vulture, a bird of filthy habits; but a useful scavenger of carrion and offal.

Stork. A long-legged bird.

Heron. A marsh bird, of which there are several species.

Bat. Numerous in Palestine; and of various species; all repulsive and forbidden; emblems of darkness and ignorance.

Fish. The forbidden kinds include the Silurus or Sheat, abundant in the Sea of Galilee, but uneatable. Also the Lamprey, Eel and Skate, all deemed unfit for food in Egypt; being carrion feeders, unwholesome, coarse, and innutritious.

Serpents. These are very numerous in Palestine.

Caterpillars. This probably alludes to a stage of locust development.

Crocodile. These abound in Egypt and the Nile.

Lizard. These are very common in Palestine, and of many varieties.

Chameleon, or Land Crocodile.

Snail. This probably means not our Snail but some Lizard, possibly the Sand Lizard.

But, besides the above list the Hebrews of those early days were restricted in certain other dietetic matters. This, again, was mainly in the selection of animal food. Thus, first, they were strictly forbidden to eat certain things, certain varieties of food under special conditions; and certain parts of animals. It is evident that these rules had mainly a hygienic aim, although doubtless partly ceremonial, like all of these restrictive laws. But the former, or sanitary reasons are not specially alluded to, doubtless because the Israelites of that day could not have

understood them. They had simply to obey, and do as Jehovah desired, evidently to inculcate trust in and obedience to their Divine leader and best friend, who, like all His human creatures, desires confidence.

2. Even among the permitted or "clean" animals, whether quadrupeds or bipeds (Ex. xxii. 21), those which had *died of themselves* were forbidden for food, with an obvious and prominent sanitary intention (Deut. xiv. 11-21; Lev. xvii. 14; Ezek. xliv. 31). This, of course, means all such as had not been purposely and properly killed for food or for sacrifice. Even the carcases of these were deemed unclean (Lev. xi. 39). "Ye shall not eat anything which dies of itself" (Deut. xiv. 21). And the reason given is, they "were an holy people unto the Lord" (Deut. xiv. 21). Still, though they might not, it was permissable to give it to strangers to eat, or to sell it to an alien for food (Deut. xiv. 2). The reason of this infringement of the law seems difficult to explain. For, in the light of modern teaching meat of this sort is often dangerous sanitarily, and apt to beget disease in the eater. And, as far as we can now judge, the law was not purely typical as this alien clause might lead us to infer. Animals which die of themselves may undoubtedly have succumbed to non-transmissable or non-communicable disease; of ailments not likely to affect the consumer of their flesh. But the reverse may also happen, a fact of which the victim might be unaware, and equally unaware that the particular carcase is morbific. He may be consuming flesh affected with some fatal disease of microbic or parisitic origin. Thus animals which have died a so-called "natural" death may possibly have succumbed to some deadly disease contagious to humankind: for example—

a From the deadly effect of parasites in their flesh or blood, *e.g.*, that of Cysticercus Cellulosus, which occurs in pork, beef and veal: or Trichina Spiralis, which occurs in birds, frogs and mammals. In these, neither salting, smoking, nor moderate baking kills the parasites which are scattered through the meat. So that preserving or curing it is no guarantee of safety.

b Or an animal may have died of one or other of the very frequent and fatal acute infectious diseases, such as rinderpest, anthrax, contagious pleuro-pneumonia, foot and mouth disease, milzbrandt, diphtheria, cow-pox, consumption, murrain (Ex. ix. 6), epidemic catarrh, typhus fever, boils (Ex. ix. 10), and other maladies resulting from blood-poisoning, thus rendering its flesh unfit for human food; which might, by consumption, be communicated to the eater; and from this focus become widely disseminated among humankind.

Those who eat or even merely handle these are apt to suffer severely with large carbuncles. Livingstone says malignant carbuncle results in South Africa from eating the flesh of diseased animals. It will be evident that serious disease of the same or an allied nature might have arisen among the Hebrews from such food. Some contagious or infectious diseases prevalent then, like "Black Death" among humankind, may have become extinct. The same might occur at the present day. It is well to prevent this, therefore, by following this wise sanitary law. And it was evidently largely with this end in view that this part of the hygienic law of Sinai was devised by its Divine originator.

c Or the microbic poison might be added or generated after death by the flesh becoming "tainted," that is semi-putrid and half-decomposed, and thus germ-laden with microbes that might become active in the consumer.

d Sometimes, again, the flesh of animals which have died of themselves may be rendered unwholesome by some drug or noxious agent consumed during life. We cannot now know what these may have been in Mosaic times, but we are aware that the present day potassio-tartrate of antimony may poison an animal's flesh to which it has been administered, so that violent vomiting, purging, &c., follow, not only among men, women and children, but even pigs, dogs, cats and birds.

e Again, the flesh of cattle fed in some districts of North America is sometimes poisoned by what they feed on, and so cannot be safely eaten. So also the flesh of Hares fed on Rhododendrons and Chrysanthemums is poisonous. Again, pheasants fed on certain buds (Calmia Latifolia) in North America are poisonous in winter and spring. So also American Partridges are sometimes similarly poisonous. And it is therefore possible that the same might occur with the animals and plants of Arabia and Judea: and that the Jehovistic knowledge of this may have, at least partly led to this ordinance, to protect his chosen people sanitarily.

The penalty for infringing this law regarding animals died of themselves, and also for the following law, was that the culprit had to atone by washing his clothes, bathing himself, and being unclean (therefore segregated) till the following evening (Lev. xvii. 10). Clearly, this purification was not

altogether typical, but was partly, nay largely, sanitary and preventive of disease.

3. Allied to the above law is the following, which ran thus, "Neither shall ye eat any flesh that is torn with beasts in the field," such as predatory quadrupeds or birds of prey. This law, however, unlike the last, embraced not only the Jew, but also the stranger. "Ye shall cast it to the dogs" (Ex. xxii. 3). The reason for this law is doubtless to be found in the fact that torn animals may have been inoculated and poisoned with toxic disease-generating matter, potomainic, microbic, chemical, or otherwise, in the torn spot, and through that in the blood and the body generally: *e.g.*, from hydrophobia from the teeth and saliva of the dog, wolf, fox, or cat bite.

In these Jehovistic laws of Sinai we thus see an obvious and doubtless intentional and tuitionary recognition and practical enforcement of the relation and interdependence of human medicine and hygiene on those of the lower animals: a study of vast importance but only recently revived in modern times.

All of these sanitary laws and precautions were obviously wise and protective of Hebrew health and life; and that in addition to their typical motive. They are equally applicable to modern life: and should also be judiciously and publicly enforced at the present day. No meat should be sold as fit for food which is not selected for slaughter, perfectly healthy, and fresh. Carcases mottled with trichinae, cysticerci, or other internal parasites or entozoa or their eggs, should be avoided as food and publicly destroyed, as these might cause widespread disease, and even death. . Putrid, tainted, or diseased meat, fowl or fish of any kind should never be eaten. Forms of saprœmia or blood poisoning, of which the most common kinds are choleraic, may follow its use, even if the decomposition is incipient. The putrefactive process in animal and vegetable foods is accompanied by the generation of potomaines, which are very poisonous and dangerous if ingested. The same holds good of all other animal products; *e.g.*, unsound milk, butter, &c. It seems proved beyond a doubt that foot and mouth disease, typhoid, scarlatina, and other specific disorders, resulting from micro-organisms may be carried through the agency of the milk of diseased cattle, or from subsequent absorption of the virus. Tubercle also and consumption may be conveyed from ailing cattle to sound persons by milk or meat food.

Although vegetables are not mentioned in the Mosaic Hygiene, it will be evident that, for the same reason, unwholesome, decayed, or mouldy vegetables should be scrupulously avoided for food. Also food containing fungi and other living particles chiefly microscopic, but, therefore, all the more dangerous to health and life by their rapid and enormous multi-

plication, by which they, perchance even in a few hours, "leaven the whole lump" of the body of the eater. All these are alike unsanitary, and dangerous both to health and life by being disease communicators. Hence those early laws regarding animals which have died of themselves, or been torn with beasts, &c., are clearly wise and good for all time; and such as ought still to be rigorously followed. The "loathing" and the subsequent "very great plague" with which the Israelites were smitten (Heb. xi. 33) for inordinately lusting for flesh food, for which quails were providentially sent (Numb xi. 20), was evidently a bodily ailment, resulting either from surfeit alone, or by one or other of the above causes, for example, *d* or *e*.

All disease must necessarily effect and deteriorate the chemical and physiological composition of flesh and tissues, affected thereby. And, therefore, the structure of our bodies is materially influenced by that of the fleshy substances on which we so largely subsist. Hence why it is of primary, personal and hygienic importance to have these as pure and healthy as possible. Cooking is capable of destroying much that would otherwise be detrimental in diseased meat. But it is not an infallible preventive. Our digestive apparatus is also powerfully destructive. But this also is not perfectly certain. And it is therefore well to see by inspection that all meat is perfectly fresh. All these facts, from modern discovery and present-day life no doubt correspond to what prevailed in the Desert days of the Hebrews. This consideration will render the far-seeing and comprehensive Jehovistic sanitary legislation seen in these Sinaitic laws not only of evident and immediate import and value to the Hebrews; but also suggestively so to us of the present day. The penalty for the infringement of this law was, that the culprit was deemed unclean till evening and obliged to wash his clothes (Lev. xvii. 15).

4. Blood was also forbidden the Hebrews as an article of diet or drink. This prohibition against any animal's blood was an early one; and made long before Moses promulgated the laws of Sinai, as it dates back to Noah, when men were forbidden to eat flesh with the blood in it. "Ye shall eat the blood of no manner of flesh, for the blood is the life" (Gen. ix. 4-5). This law continued till the Mosaic era, when it was embodied in the laws of Sinai, and inculcated not only on the Hebrews, but extended to strangers in the Hebrew camps and cities (Lev. xvii. 10-12-13). They were commanded to eat no manner of blood, whether of fowl or beast (Lev. vii. 26-27); *i.e.*, the blood of any manner of flesh; the reason being given in various forms, thus "for the life of the flesh is in the blood" (Lev. xvii. 10); "for it is the life of all flesh" (Lev. xvii. 14); and, again, "the blood is the life" (Ex. xii. 23); also "for the

life of the flesh is the blood" (Lev. xvii. 11-12). All this means that blood contains the principle and pabulum of life, and was only to be offered at the altar (Lev. xvii. 11). But beyond this there was the main or symbolic reason, "It is the blood that maketh atonement for the soul. I have given it upon the altar to make an atonement for your souls" (Lev. xvii. 11-12). Hence this law was clearly enacted principally to increase the typical value of blood as an atoning agent. Blood is the great atoning agent in sacrifice (Mark xiv. 24). All blood was thus forbidden, and all flesh containing blood, except perhaps fish (Lev. vii. 26). Ye shall not eat anything with the blood (Lev. xix. 26). The law also extended to flesh cut from live animals. To shew the importance of this law it was frequently reiterated in the Pentateuch in different forms and with marked point to give it especial force and prevent its being evaded or forgotten or misconstrued (Lev. i. 14; iii. 17; xix. 26; Deut. xii. 23). So strict was this law that if a Hebrew or a stranger sojourning among them hunted or caught a beast or fowl for food its blood had to be poured out and covered with dust," for it is the life of all flesh; the blood of it is for the life thereof" (Ex. xvii. 14). On this account the law regarding the killing of food-yielding animals before being cooked and eaten, was made very strict from early times, and regulations were such as to secure to the fullest extent the removal of the blood, not only from the larger but from the smaller blood vessels, and thus ensure the complete fulfilment of the law; and that the blood so drained from the animal was covered with dust to ensure its dispersion or destruction. The early rule was repeated even more forcibly to the tribes in the Wilderness under severe penalty. For, while an offender in general dieting was only to be "deemed unclean till even" (Lev. xi. 40; xvii. 15); "whatsoever soul eateth any manner of blood even that soul shall be cut off from his people" (Lev. vii. 27; xvii. 10-14; i. 14; Deut. xii. 23). But, besides the primary, chief, and typical nature of this law regarding the dietetic avoidance of blood, made principally to emphasize the emblematic efficacy and value of blood as a sacrificial and atoning agent; there is, also, the evident hygienic or sanitary aim; the value of which is daily becoming more apparent, and of increasing importance in the light of modern medical discovery as to the true nature of some of the most frequent and formidable of those diseases that have their origin and chief seat in the blood and blood-vessels; and notoriously the large class of infectious and contagious diseases; but also many others of a non-febrile and chronic character. Thus, to summarize:—

a Meat well drained of blood keeps longer than that which retains it; because blood is a highly organized and

very complex chemico-vital fluid, and therefore especially liable to rapid decomposition. This is clearly an important consideration in such warm countries as Judea and the Arabian Peninsula. Moreover, it is probably healthier; and "kosher" meat, in addition to this, has decidedly a more delicate flavour.

b Blood-drained meat is more sanitary than that which retains it; because any blood disease or disease germs which the animal might harbour would most likely be concentrated in that all-pervading fluid: and, if eaten, might perhaps be grafted on or into the consumer. The scrupulous draining of blood from meat might thus prevent disease arising from microscopic germs difficult to kill or even sterilize and render inert, even by cooking and the best of germicides, high temperatures; a fact especially true of the large class of parasitic diseases.

c Again, the law had doubtless another important aim; namely, to keep the Hebrews from certain cruelties in which neighbouring nations may have indulged or might yet do so; *e.g.*, the semi-barbarous Abyssinians mentioned at a later day by Bruce, who cut out and devoured flesh from the flanks of living animals.

d Again, the Heathen in certain of their rituals, especially in solemnizing covenants, and as a pledge of idolatrous worship, sometimes drank the blood of the sacrifices (Ps. xvi. 4; Ezek.xxxiii. 25). This law would clearly prevent imitations of this form and rite of idolatry by the Hebrews.

e The ordinance thus had broadly a national isolating object and tendency respecting neighbouring people who were mainly idolaters.

5. The Hebrews were also forbidden to eat certain portions of the fat offered in sacrifice (Lev. iii. 9-10): this being set apart for the Altar (Lev. iii. 16). The offering of this, the select part of the animal, was purely complimentary to Jehovah, agreeable to the dictates of natural feeling, and essentially typical: and that in every variety of offering, whether this was a peace offering (Lev. iii. 9); consecration offering (Lev. viii. 25); sin offering (Lev. iv. 8); trespass offering (Lev. vii. 3); or redemption offering (Numb. xviii. 17). "All the fat is the Lord's; it shall be a perpetual statute for your generations throughout all your dwellings that ye eat neither fat nor blood" (Lev. iii. 17). The sacredness and stringency of this law was shewn by the fact that the penalty for infringing it by eating the fat of an offering made by fire unto the Lord was that the soul was to be cut off from his people (Levit. vii. 26). This pro-

hibition against eating rich fat offered in sacrifice has also been supposed to be partly hygienic; because its use was unwholesome in the hot climate of the Desert and Palestine. No doubt it was so. Still the rule is not extended to non-sacrificial animals so as thus to debar the consumption of their fat. The fat and suet of the ox, goat, sheep, lamb, were also forbidden the Hebrews, especially all fat in masses discernable and separable (Lev. iii. 14-17; vii. 23); doubtless largely for dietetic and sanitary reasons, clearly known or foreseen by the Deity when He instructed Moses. The Hebrews were partial to well-fatted meat. "It shall be a perpetual statute for your generations throughout all your dwellings that ye eat neither fat nor blood" (Lev. iii. 7). Both fat and blood of all kinds were thus clearly forbidden: of course largely because they were insanitary. This, of course, meant the eating of them in bulk; that is separated and unmixed with other animal tissues, as in the broad and fat tail of their sheep, the fatty collections usually found round the kidneys and other internal organs. For it is obviously impossible to wholly separate either of them from the muscle even of "kosher" or blood-drained meat. Some blood must necessarily remain, especially in the capillary blood vessels, and some fat is always mixed or interlaid with the flesh in ordinary meat. This fattening, warming, stimulating, and to many enticing variety of food was apt to cause or increase both corpulence and laziness, especially in that sub-tropical climate. Taken broadly this was also a wise sanitary law; and one which ought to be followed largely by all, especially by sedentary, inactive and stout people, particularly in sultry regions where, or in warm seasons when fatty, heating food is not required; and also where skin diseases are frequent or virulent. An additional law was, that the fat of ox, sheep, goat or any other beast which dies of itself or was torn with beasts, was not to be eaten; though it might be used for any other purpose (Lev. vii. 24-25). Of course this was optional and discretional, and need not have been followed if the meat came under class 2 and was morbific.

6. The sinew of the hollow of the thigh was also forbidden as food (Gen. xxxii. 32). This was evidently a special, temporary, and memorial ordinance to keep the Hebrews in mind of a special incident in the life of one of their great ancestors, Jacob; centuries before; which caused in him a God-imposed and memorial limp (Gen. xxxii. 25-32).

7. Things strangled were also forbidden both to Jews and Gentiles for food, both in Mosaic and in Apostolic times (Acts xv. 20-29; xxi. 25). This was evidently in terms of torn with wild beasts (3); and partly in terms of (4), because they contained the blood (Gen. ix. 4; Levit. xvii. 13-14; Deut. xii. 23-24).

8. The Sinaitic Law also forbade "seething a kid in its mother's milk" (Deut. xiv. 21). The reason of this prohibition in dieting it is difficult to understand. But it was probably directed against some heathen harvest usage. This law is thrice repeated.

9. Things offered in sacrifice to idols were also forbidden as articles of diet: obviously to prevent the superstitious use of consecrated food common among the heathen of that day; who preserved food which had been offered to idols for use on special occasions and for change. This law was obviously symbolic and not sanitary; and aimed at keeping the Hebrew nation apart and select. The Hebraic law of sacrifice was very different. This latter law was meant to promote hospitality and liberality to the poor. The Mosaic Law ordained that the flesh of the sacrifices of peace offerings for thanksgivings was to be wholly eaten the same day it was offered. So also the flesh of the Paschal Lamb was to be roast with fire and eaten with unleavened bread and bitter herbs on the night of its slaughter (Ex. xii. 8); not raw or sodden with water; and symbolically with girt loins, sandals on feet, staff in hand, and in haste (Ex. xii. 11). Immediately after this feast of four days, was one of unleavened bread for seven days, during which unleavened bread alone was to be eaten (Ex. xii. 10). This law was reiterated in Apostolic times, *e.g.*, by James (Acts xv. 20-29; xxi. 25).

In all this the breadth and comprehensiveness of the Deity's great educational scheme for human enlightenment is further illustrated by the care Jehovah took to point out to the hygienically-ignorant Hebrews the broad outlines of Dietetic sanitation; and chiefly its base facts, the necessity that everywhere and always exists for careful attention to dieting, the imperative necessity for having a judicious selection of food and food animals; and the danger that lurks in an indiscriminate reception of animal food products: for He strictly interdicts the use of the following large class of animals and animal products:

1st. The predatory quadrupeds, birds and fish; certain reptiles, insects and molluscs.
2nd. Animals that have died of themselves.
3rd. Flesh torn by predatory beasts or birds of prey.
4th. Blood of all kinds.
5th. Fat, especially if massed.
6th. The sinew of the hollow of the thigh.
7th. Things strangled.
8th. Kids seethed in their mother's milk.
9th. Things offered in sacrifice to idols.
10th. Flesh torn or cut from live animals.

This Hebrew dietetic law and carefully selected and tabulated

list of permitted or denied food, animals, and parts of animals, clearly had a multiple purpose; viz.:—

1st. It had a primary and important relation to the theocratic idea; that of the God-King catering and watching over His human children and subjects; and of the Hebraic, and beyond it the human family, being watched over and provided with what they required and kept from what was detrimental.

2nd. The division of food and food animals into "clean" and "unclean" was doubtless largely, primarily, and specially ceremonial and typical; by which certain things were deemed unfit for God's special nation. "For thou art an holy people unto the Lord thy God" (Deut. xiv. 21). Physical food being allegorically employed to illustrate nourishment for the human soul, morals and mind; all of them matters of the utmost and indeed eternal import to mankind generally as well as to the Hebrews. "Ye shall sanctify yourselves and shall be holy, for I am holy, neither shall ye defile yourselves" (Lev. xi. 44-45). It has been suggested that this law of food selection was meant to shew how necessary it is to take up and assimilate the animal element into the Hebrew body and life with great circumspection and discretion; so that its guest, the soul, might not become debased, degraded, profaned, filled with animal affections and tendencies, and disqualified from drawing near to God. Hence only the more complete, pure and less animal organizations were to be eaten. This promoted purity of spirit. But is not this law suggestive and a hint that the spiritual, moral, social and mental food in which we indulge in our daily life ought to be as carefully selected; seeing that "unclean" kinds are far more injurious to the higher nature than "unclean" diet is to the physical frame?

3rd. These precepts regarding food and feeding were doubtless also ordained for the Hebrew discipline and instruction in obedience, the renunciation of self-will, and the inculcation of self-restraint, control of the appetites and propensities; three things as hard to manage then as now.

4th. They unquestionably had a further and important motive, namely, to support and strengthen the barriers which God had purposely, for higher educational purposes, raised between the Israelites and other outside nations, which were figuratively deemed "unclean" (Lev. xx. 24-26), in order to elevate and keep the

Hebrew race "holy" and "separate" and isolated from strangers or surrounding nations, who indulged in these unclean animals for food, and might lead his people astray therein. And especially to prevent their participation in idolatrous festivals, practices and evil customs. For example, camels' flesh and milk, used by the Arabs, were forbidden the Jews, to make a marked spiritual, moral, and social, as well as dietetic distinction between them by this physical restriction and others. So also swines' flesh was forbidden, to separate the Hebrews from the Egyptians and other orientals who ate it at some idolatrous feasts. But mainly, perhaps, because Orientals generally avoid it, as it is believed to be prone to produce or promote cutaneous diseases. The Hebrews were even forbidden to touch a swine's carcase. These laws of dieting thus shewed and taught that the Hebrews and other nations were not on a level before God. This separateness of the Israelites as a people was meant to keep Jew and Gentile apart. The aim of this law, like all else in the Sinaitic Code, was to inculcate cleanliness and purity in physical matters, even in eating, drinking, clothing, and everything personal as typical and promotive of spiritual, moral, social and mental matters. This secondary ceremonial and typical meaning of food selection or rejection is both evident and strong. It points to the idea that purity is as necessary in diet as in all other details of life; and as necessary in the latter as in the former for "health." And this ritual was a landmark of that stage of their spiritual education; as distinguished from the dictum of the future and greater Hebrew law-giver who was to inaugurate the higher doctrine, "there is nothing from without a man that entering in him can defile him" (Mark vii. 15).

5th. Comparing the clean and unclean Mosaic lists from a sanitary aspect, there can be no doubt on which side the balance of wholesomeness lies. The selection and prohibition ensure the maximum of private, public, national and racial health, the longest lives, and the least amount of disease; with a minimum of the inconvenience that arises from non-restriction; in addition to the national distinctness which it implies. So that no unprejudiced mind studying the history of the Wanderings and the evidence of the general health of the Hebrew people, can doubt that this law of selection of food, was not also and very largely and intentionally

so, physiological and sanitary, and meant to preserve and promote the Hebrew health; and prevent such diseases of erroneous and faulty assimilation, that might arise from uncleanly and unwise dieting and non-compliance with this law. As well as unmistakeably and largely to promote physical or hygienic cleanliness in eating and dieting and food selection, as in all else. This conclusion is corroborated by the noteworthy fact that the Sinaitic list of edible and obnoxious animals corresponds exactly with that which popular instinct, habit, usage, preference or tradition have, as a rule, selected both among savage and civilized peoples, as those which ought to be scrupulously avoided or invariably selected, because deemed most wholesome, nutritious and consonant with individual and national taste. This latter fact, moreover, conjoined with the Biblical seems to prove that the latter selection was not made expressly for Hebrew, but also for a wider motive and Gentile adoption. It is pleasant thus to find heavenly endorsement of this, one of our most widespread human beliefs and customs. The symbolic and sanitary aims were thus commingled in these dietetic laws of the Hebrews. Some were more sanitary than symbolic, and others vice-versa. Thus the avoidance of eating things offered to idols was purely symbolic; so with the sinew of the thigh. All of the other ten prohibitions, however, were mainly sanitary: some more so, others less.. These laws were not only practically but didactically sanitary. Munster states the prevalent Jewish belief that unclean food

1st. Generates putrefaction and various ailments.
2nd. Weakens the digestive power.
3rd. Disorganizes the whole body.
4th. Hinders men in God's service by making them listless, dispirited, and weary towards good works.

This proves the existence of a knowledge of sanitary danger; probably originally derived from Mosaic instruction in the Desert.

How incomparably wise in their entirety are these Sinaitic or Mosaic laws of dieting and food selection. And how unmistakeably and progressively important does their sanitary aim appear year by year, viewed from the standpoint of Nineteenth Century research; these days of microscopes and micro-organisms; and the subtle searchings and strange teachings of physiological and pathological chemistry. Still, complex as

seems to us even yet the chemistry and the physiology of dieting; intricate as are the physiological processes of the human frame which the food is destined mainly to carry on; how clear and simple and open are they all now, as they ever were, as they were when these laws were framed, to the eyes "of Him with whom we have to do," the All-knowledge and Wonderful Counsellor, who thus demonstrated both His love and His acumen in His judicious and philosophic dieting of the early Hebrews. The supreme and infallible Sanitarian by His selection of judicious and rejection of unsuitable food for His human creatures did what none of the most erudite men of that day could have done for the Hebrew host: did what the Hebrew and Egyptian Priests, what the learned School of Heliopolis, and even what its most erudite alumnus, the thoughtful and medically educated Moses, could not alone have accomplished, for lack of the necessary knowledge and ignorance of the laws of a then unborn science, that of sanitation. Jehovah did not require to learn that science, to undergo progressive and slow indoctrination in its laws. The highest and perfect sanitary Expert did not have, like us, to amass sanitary knowledge by slow degrees, patient experience, and the slow summing up and correlating of hygienic ideas and facts. He made and knew the science thoroughly. It is surely wise in us to willingly follow rules thus highly endorsed; and which in the main have been so long unwittingly followed; rules that are thus Biblically, popularly, experimentally, and theoretically commended. It is an interesting fact that the Mosaic laws and customs, and the distinctions between clean and unclean animals and food, are still kept up among various classes of people in modern Judea, though not exactly as Moses ordained.

At the same time, however, this Jehovistic distinction between clean and unclean animals and kinds of food in the Hebrew regime, is not meant to disparage anything that He has created. Everything brought into existence by the Supreme has its object and mission. Some animals are created as special food animals, while others are not, but meant for different other purposes. These two classes, their existence, and even details, the Maker beneficently points out for Hebrew and human enlightenment in the Pentateuch; and also for our sanitary benefit.

Many kinds of animals, and certain parts even of edible and permitted ones, being thus debarred from the Hebrew dietary; let us now enumerate on what those of the 40 Years' Wanderings and those of the succeeding settlers in Canaan usually subsisted. Although the "clean" or permitted quadrupeds, birds, fish, &c., given in Table V, as those which the Israelites might eat, it does not follow that they chiefly subsisted on these

or that they were their usual articles of diet. The following list, however, contains the things most frequently selected.

The term "meat" in the Bible is usually one of the widest possible significance; and embraces all kinds of eatables, animal and vegetable: everything that can be eaten or can nourish the frame. In short, it is synonymous with food. Only once or twice does it mean "flesh."

Animal food was not much used by the Hebrews; as with most nations located in semi-tropical countries:—

1st. Because the warm climate made it unnecessary and undesired by the body; by diminishing the physiological waste and the craving for meeting this. And by making the consumption of too much meat unwholesome and unhealthy.

2nd. The heat of those regions necessitated the immediate consumption of freshly killed meat: otherwise it would taint and putrefy. So that they killed as little and as seldom as possible. The necessity for the immediate consumption of a whole animal made it expensive to kill.

3rd. The Mosaic law and ritual lessened it in various ways, especially by promoting moderate flesh consumption.

In their Desert days the Hebrew food was not very varied, but consisted mainly of:—

Quails. These they had at least on two occasions (Ex. xvi. 13; Numb. xi. 31), namely, in the Wilderness of Sin and at Taberah. On the second they were taught a special lesson on dieting, applicable not only to that but to all kinds of food; on the folly of surfeit and over-indulgence. On these occasions Quails "covered the camp." The supply must have been one of those vast flocks that in spring migrate northward from Africa and Arabia, evidently brought by heavenly intervention over the Hebrew camp for their dietetic supply.

Manna. This was the chief diet of the Hebrews in the Desert. In nature we find many food stuffs, and these fortunately, but doubtless providentially, among the most abundant; that furnish in themselves and without addition, all the elements necessary for the sustenance of the Animal Kingdom generally, mankind included. These contain all of the chemical and physiological elements necessary for this purpose, skilfully and palatably combined in forms of food and diet, so that from them all the fabric, bone, muscle, blood, fat, cartilage, tendon, hair, skin, and every other tissue and organ in the living body may be formed after Nature's own perfect and special selective methods. Some of these are animal productions; *e.g.*, the egg, in which we may note the growth and development of the chick. Milk is another, on which the young of the mam-

malia, man included, thrive. Others, again, are of vegetable origin, *e.g.*, the Cereals (wheat, oats, barley, &c.), and pulse or leguminous productions (peas, beans, lentils, &c.). Manna must have, in one respect, viz., composition, resembled these, and contained not only carbonaceous or heat and fat generating; but also nitrogenous (muscle making) and all other matters capable of sustaining the human frame in high health and vigour. Like the pulse (Dan. i. 15), which made Daniel and his companions' faces fairer and fatter than others more daintily fed, so Manna fed the Hebrews well and satisfactorily for 40 years; namely from the Wilderness of Sin (Ex. xvi. 1) to Gilgal (Josh. v. 12). And they never seemed to have wearied of it but once (Numb. xi. 6), when that querulous and unruly nation, so hard to please, lusted for other food. In this respect it resembled bread, potatoes, and other kinds of food of which we never seem to weary. It was an entirely new article of diet; for Moses says it was what "thy fathers knew not" (Deut. viii. 16). And must have been a bread-stuff specially formed by Divine synthetic chemistry, in and from materials in the atmosphere, from which it was deposited on the ground each morning as required. This was "the bread which the Lord" gave the Hebrews (Ex. xvi. 15). This strange food, about which the Hebrews questioned one another by saying "Manna" (What is it?), thus giving it a name, was not the ordinary Manna of that neighbourhood, which grows spontaneously in Egypt, and with which the Hebrews were doubtless well acquainted. It was a new and special variety of bread, the staff of life, which was found in the form of a round thing like coriander and small as hoar frost; which melted when the sun waxed hot (Ex. xvi. 21); and if kept till next morning, in opposition to Divine Command, it stank and bred worms (Ex. xvi. 14). No doubt to prevent this, teach obedience, and warn against gluttony, a bowl or vessel full containing about five English pints were gathered daily per head; and on Saturday two measures, to last over the Sabbath. This miraculous feat in the chemistry of the organic compounds; impossible to human manipulators; would be an easy task to the Maker of the Universe; who personally superintended this and all else that concerned the Hebrews of that day. The synthetic formation of Manna and its daily deposit were as miraculous, and as great a proof of Divine power as was the multiplication of the five barley loaves and two small fishes long subsequently, to feed thousands in the Holy Land; and is what still is and what will probably ever remain inexplicable to humanity; and a memorable demonstration to us, as to the Hebrews, of the measure and creative power of the Divinity, so different from ours. The Divine or super-human origin and special nature of Manna,

were further proved by the Jehovistic Command to keep a specimen of it in a golden pot in the Ark (Heb. ix. 4). The only natural production with which Manna may be compared, and even that comparison is far-fetched, is with a small fungus that grows in the Desert Sand, called Truffles. This constitutes the staple food of the Bedouin Arabs when travelling there.

After settlement in Canaan the Hebrews had a wider choice of food. Thus:—

Meat. The Hebrews fully appreciated well-fatted meat, which they esteemed a luxury: and had their stall-fed oxen and calves (1 Kings xxiii.; Luke xv. 23). Fatted fowl was among the daily provision for Solomon's table (1 Kings iv. 23). Still, only in Royal households was meat consumed daily (1 Kings iv. 23; Neh. v. 18). As a rule the Hebrews, although permitted the free use of meat (with the restrictions already given) generally used animal food for hospitality only (Gen. xviii. 7); as at festivals, whether religious (Ex. xii. 8); public (1 Kings i. 9); or private (Gen. xxvii. 4). The animals generally used were calves (Gen. xviii. 7); lambs (2 Sam. xii. 4); oxen under three years (1 Kings i. 9); kids (Gen. xxvii. 9); hart, roebuck, fallow deer (1 Kings iv. 23); rams, goats (Bashan breed). Meat was never eaten by itself, but with some other accompaniment, *e.g.*, bread, milk, sour milk (Gen. xviii. 8); or bread and broth (Judg. vi. 19); bread and honey-comb (Luke xxiv. 42); or fish (Mat. xiv. 19).

Butter. This was among the more prominent animal products used as diet. This was set by Abraham before his heavenly guests (Gen. xviii. 8).

Milk. This, both natural and curdled, and its different preparations, was another article largely consumed. Milk is a more important article of diet in Eastern than in Western countries, and indeed one of the chief, being regarded there as a substantial food adapted to all ages and classes, and not for the young only, the sick, or as an adjunct to cookery. In the Hebrew dietary it holds a conspicuous place: and was deemed among the chief things for the whole use of a man's life (Eccles. xxxix. 26). It was employed as the emblem of abundance and wealth, both itself (Job xxi. 24), or with honey (Exod. iii. 8); or wine (Is. lv. 11-12). The milk, generally used was that of the cow or sheep (Deut. xxxii. 14); or camel (Gen. xxxii. 15); goat (Prov. xxvii. 27). The latter was most highly prized. The Promised Land was described as flowing with milk and honey (Ex. iii. 8). Milk was used either in its natural fresh state (Gen. xviii. 8); or more generally as Leban, sour and coagulated; and either as a simple beverage or mixed with flour, meat, and even salad (Gen. xviii. 8; Judges v. 25; 2 Sam. xvii.

20). It was offered in hospitality to passing strangers (Gen. xviii. 8). Milk is generally offered to travellers in Palestine in a curdled or sour state, thick, and almost like batter. Milk, still, in a certain season of the year, forms a great part of the food of the poor in Syria, as butter and various forms of coagulated milk (Job x. 10; 1 Sam. xvii. 18). Milk in different forms took the place of our malt liquors for the Hebrews.

Eggs were also used for food by the Hebrews; but were probably a delicacy (Is. x. 14).

Butter. Churning was unknown to the Hebrews. So that what they called butter was really curdled or clotted milk or cream, *i.e.*, compressed cheese. But with milk and cheese this was extensively used. Sometimes the curd was allowed to ferment, which gave it a pleasant acid flavour.

Honey. Bee and Wild or Rock Honey was another animal food product, extensively used by the Hebrews; and therefore important (1 Sam. xiv. 25); and was used as a substitute for sugar (1 Sam. xiv. 27): and was eaten either alone; or as butter and honey (Is. vii. 15-22); or as milk and honey, a rare rich diet; or as oil and honey with bread (Ezek. xvi. 13-19). Or it was used in certain kinds of cake; or with other things, even fish (Luke xxiv. 42). Honey abounds in Arabia and Palestine. Honey bees abounded even in the remotest parts of the Wilderness (Ex. iii. 8): where they deposit their honey in rock-crevices or trees; such as Johnathan ate in the wood (1 Sam. xiv. 26); and St. John in the Wilderness (Mat. iii. 4). Judea was a land flowing with milk and honey. As with other edibles and luxuries, excess is deprecated scripturally; and too much honey deemed unwholesome (Prov. xxv. 27).

Birds. Those usually eaten were fowls (Neh. v. 18); quail (Ex. xvi. 13); poultry (1 Kings iv. 23); guinea-fowls.

The "first fruits" of certain things were consecrated to God; and He appropriated them to the maintenance of the Priests. In accordance with this certain parts of animals were thus set apart for the Priests by the people who offered sacrifice; Whether this was an ox or a sheep they had the shoulder, two cheeks, and the maw.

Fish. Only those of the "clean" kind with fins and scales were eaten (Lev. xi. 9). It has been suggested that fish was freely consumed by the Hebrews of the Wanderings. If so it must have been brought from the Red Sea or Gulf of Akaba. In Canaan fish appears to have been the usual food around the Sea of Galilee (Mat. vii. 10). It was used both fresh and salt (Mat. xiv. 19; xiii. 16). It was usually eaten with bread (Mat. xiv. 19); or honey-comb (Luke xxiv. 42).

Locusts. These were occasionally eaten (Mat. iii. 4); but

were deemed poor fare. Only certain species were "clean" and permitted (Lev. xi. 22).

Vegetable Food. The diet of the Hebrews, as of most nations in semi-tropical countries, has in all ages been materially different from ours; having been simple, light, and more vegetable than in colder northern countries. Custom thus enjoins and follows what providence provides and sanitary science suggests.

Bread and Cakes in different forms were largely consumed by the Hebrews; and considered one of the most important and staple articles of diet: and was indeed so highly prized as to be called "staff of bread" (Lev. xxvi. 26; Ps. cv. 16; Ezek. xvi. 14, 13). While many articles were eaten as its accompaniments. Perhaps the most frequent of these was milk. And as these two, bread and milk, were used by the Hebrews, a nation under God's special care and tuitional dieting, we may justly deem these as not only safe but most important articles of food for the ordinary consumption of mankind generally. Both of them give the maximum of nourishment with the minimum of refuse. Moreover, both offered the precise material for the healthy growth of every tissue and organ in the human body. This is best shewn in the case of children, who thrive and grow strong even if given no other food. All the other articles of Hebrew food were mainly viewed as subordinates to this the staple commodity. Their best bread was made of wheat; and wheaten-flour, of which they made cakes or cracknels; also baked corn. The inferior bread used by the poor was made of barley, in the form of barley meal (Numb. v.); or barley bread (Judg. vii. 13; Lev. ii.); or as barley cakes (Ezek. iv. 12); or as wheat and barley mixed; or as these to which flour of beans, lentils, or millet was sometimes added. Barley bread was one of the most ancient articles of diet; though less esteemed than wheat as bread; and used only or mainly by the very poor and degraded (Judg. vii. 13). Barley was largely cultivated in Palestine (Deut. viii. 8): and was mentioned among the valuable products of the Promised Land (Deut. viii.). As with us it was eaten in various forms. In the natural state, being rubbed off the husks as fresh green ears; or more frequently the husked grains were roasted to form "parched corn" (Lev. xxiii. 14). This was an ordinary article of diet, especially among labourers, unable to have their food more elaborately cooked. Or it was bruised (Lev. ii. 14-16), and then dried in the sun, mixed with oil (Lev. ii. 15), or made into dough or soft cake (Numb. xv. 20). And with it they used a great variety of articles to give a relish (John xxi. 5); *e.g.*, salt as flavoring (Job vi. 6); sour wine (Ruth ii. 14), called vinegar, drunk by the labourers (John xiii. 26); or dipped in meat gravy (Judg. vi.

19); or with some sop such as broth, meat-soup, or melted fat (John xiii. 26); or with fruit, vegetables, fish or honey. For seven days during the Passover the Hebrews had to eat unleavened bread, even the "bread of affliction" (Deut. xvi. 3); so called either because it was insipid and unsavoury, or because eaten in remembrance of the bitter bondage out of which they had been delivered.

Oil. Vegetable or olive oil was not much used, and only in frying fish; butter being usually substituted; oil being an expensive luxury (Prov. xxi. 17), and reserved for festive occasions (1 Chron. xii. 40); and then chiefly in certain kinds of cake (Lev. ii. 5; 1 Kings xvii. 12; Luke xi. 12).

Succulent Vegetables. A meal consisting only of vegetables was considered very poor fare (Prov. xv. 17; Dan. i. 12; Rom. xiv. 2). Those most frequently used were:— *Pulse* (roasted): *lentils* (Gen. xxv. 34): *beans* (roasted) (2 Sam. xvii. 28): these three were largely used. *Leeks, onions, garlick* (Numb. xi. 5); *endive*, and *cucumbers* (Numb. xi. 5), were all in general favour. Lettuce or "bitter herbs" (Ex. xii. 8; Numb. ix. 11). The usual mode of eating vegetables was in the form of pottage (Gen. xxv. 29; 2 Kings iv. 38; Hag. ii. 12).

The Priests had the first fruits of corn, wine and oil (Deut. xviii. 3-4).

Fruit abounded in Palestine, and was another great source of subsistence; though deemed more as a luxury. Thus:— *Figs*, fresh, early and summer fruit, first ripe (Hos. ix. 10); were much used, and esteemed a great luxury (Amos viii. 1-2; Mic. vii. 1). Figs dried and pressed into cakes were also used (1 Sam. xxv. 18). *Prunes. Grapes* were also much used, either fresh, or dried as raisins (1 Sam. xxv. 18); or as cakes (2 Sam. vi. 19). *Apples* (probably Citrons) were also much used (Can. ii. 5). So also were *Dates* (2 Sam. xvi. 1; Joel i. 12). So also were *Pomegranates* (Cant. viii. 2). So also were Melons (Numb. xi. 5). And *Sycamore Fruit. Mulberries* (Luke xvii. 6) were also eaten. Also *Nuts, Almonds*, and *Pistachios.*

Condiments or Spices. Those used by the Hebrews were numerous, and included *Cummin* (Is. xxviii. 25): *Dill* or *Anise*: *Spice* of certain nuts; *Coriander* (Ex. xvi. 31; Numb. xi. 7: *Mint* (Mat. xxiii. 23): *Rue* (Luke xi. 42): *Mustard* (Mat. xiii. 31). *Pistachio Nuts* and *Almonds* were also eaten to whet the appetite (Gen. xliii. 11). *Salt* (Job vi. 6) was their chief condiment; and deemed one of the most important things for the whole use of Man's life (Eccles. xxxix. 26). It was eaten with every meal, and employed as a symbol of friendship. Salt was also largely used in the Hebrew ritual. All meat offerings and oblations were to be offered with salt and not with leaven (acid lees of

wine); or with honey, which is apt to turn sour. Salt was then, as now, the great and universal preservative of animal and vegetable substances from decay and putrefaction. And so it is often used in the Bible as an emblem and symbol of purity, perfection, perpetuity, and fidelity.

Although a special chapter (Part 2, Chap. 3) has been devoted to the subject of Hebrew drink, it will not be inappropriate here to mention the chief Hebrew beverages, as these are so often derived from foods, or food stuffs. The principal drink, as in most countries, was *Water*; *Milk*; *Barley-water*; *Fig-cake Water* for refreshment; *Intoxicants* for the wealthy; *Grape-juice boiled* (Neh. ii. 1) and unfermented; but more generally fermented as *Wine*; strong drink (Shechar) (Lev. x. 9); the juice of any fruit, especially the grape, when fermented and intoxicating. *Sour Wine* or Vinegar for the poorer classes (Ruth ii. 14), the wine having undergone the second or acetous fermentation. *Beer*, made of barley. Honey Wine.

In these early times the cook was usually the mistress of the household (Gen. xviii. 6). There was a great similarity between the culinary operations of the Hebrews and Egyptians. Vegetables were usually boiled and served as pottage (Gen. xxv. 29). Fish also was cooked, probably broiled (Luke xxiv. 42). But as flesh meat was not an article of ordinary diet among the Hebrews; the art of cooking was not carried to any perfection. Their warm climate promoted early putrefaction; which again necessitated immediate consumption of the animals killed for food; and the slaughtering of none except for hospitality or festivity. Whether the animal killed was a kid, lamb or calf, this was done by cutting its throat, so that it was well bled (Lev. vii. 26). After being flayed it was either:—

a Roasted entire (Ex. xii. 46) over a fire (Ex. xii. 8) as with the Paschal Lamb, or in an oven: or it was

b Boiled. This was the usual mode, both with sacrifices other than the Paschal Lamb (Lev. viii. 31) and for domestic use (Ex. xvi. 23). In this case the animal was cut up. The Priest's joint (right shoulder) being first taken off (Lev. vii. 32). The rest was then jointed, bones broken, and the flesh cut off. It was boiled with water (Ex. xii. 9), or in milk (Ex. xxiii. 19); over a wood fire.

In the Hebrew cookery or meals, apparently heterogenous elements are and were frequently combined. Bread and cake baking was usually done daily. They rose early, about dawn, and took a light breakfast; after that they had usually two chief meals a day, viz., dined about 11 a.m., lightly; the second after sunset was the principal meal, substantial and sumptuous. They

also gave sumptuous repasts on great festival days, birth days, marriages, funerals, and all high occasions. Pulse and water were considered poor diet (Dan. i. 12). In sorrow and fasting food was either altogether abstained from (2 Sam. xii. 17-20); or delicacies only; such as meat, wine, &c. (Dan. x. 31). Prison diet consisted usually of a small quantity of bread and water (1 Kings xxii. 27; Jer. xxxvii. 2). Jacob's mess of pottage sold to Esau shews how simple was their ordinary diet in early times. Doubtless much of the anicient Hebrew healthiness and longevity were due to this simple dieting, like Daniel's in after times (Dan. i. 12-15). Isaac's savoury meat was evidently unusual (Gen. xxvii. 4-17). Abram's feast to the Angels consisted of calf's meat, new cakes, butter, and milk (Gen. xviii. 6-8).

This list is more curious than useful, and shews that their food was not much different from ours. They used more vegetable stuffs than we do. We use more meat than they did. Both factors agree with their warmer climate and more inert mode of life; and with ours. Their food was usually and for long very simple (1 Sam. xxv. 18; 2 Sam. xvi.; 2 Sam. xvii. 28). The chief difference lay in their simpler and therefore perhaps better cooking. They had not quite so wide and varied a selection as we have, mainly for purposes connected with their spiritual, moral, social, and sanitary education.

That the Hebrew dietetic lists and strict food selection was not meant to be perpetual or universal, at least exactly as Moses has penned it, is shewn by Acts x. 15 and 1 Tim. iv. 4. Mankind may now select whatever animal food best suits his taste and health. Sometimes, in accordance with this removal of the interdiction, and sometimes not, we find many of the forbidden Hebrew foods are eaten in different parts of the world, but only by certain peoples and tribes, usually savage or semi-civilized peoples, as they find the food convenient, easily procured, or satisfactory to their particular taste. They are not universally consumed, however; and when they are pretty often consumed in certain localities, this may be considered as arising from depraved or singular taste or scarcity of better food, and akin to the consumption among ourselves of tainted or putrid game. As examples of this odd selection of animal food by different peoples we may select the lion, lynx, wolf, skunk, cat, dog, bear, hedgehog, mouse, rat, porcupine, camel, horse, elephant, rhinoceros, tapir, hippopotamus, armadillo, sloth, ostrich, parrot, bustard, albatross, cormorant, gull, pelican, penguin, lizard, snake, crocodile, toad, moth, caterpillar, cuttlefish, sea slug. One or other of these is eaten by the inhabitants of some part of the world; and is neither deemed unclean, unsavoury, or forbidden, but the reverse. Most nations, however, and all of the

more civilized and sanitarily enlightened ones, wisely keep more strictly than this to those varieties which are not interdicted by the Sinaitic Code: and avoid this hygienically eccentric and unorthodox dieting when they can.

During the Wanderings the Deity thus demonstrated to the Israelites and humanity at large his creative and fertile power and might by miraculously feeding them with appropriate food; as well as his scientific acumen by elaborating a practical and wise dietary: and also His interest in them by pointing out inferentially that food and feeding are potent agents for sanitary good or for morbific evil. This dietetic, hygienic, and physiological advice of Jehovah's is strictly accurate, far-reaching, useful and scientific; and antedates our modern self-acquired knowledge by over 3,000 years. The sanitary and dietetic information thus revealed and bequeathed is not purely meant for the Hebrews; nor, though ancient, is it antiquated; nor, though Biblical, is it superficial, but medically correct; nor, though largely typical and ceremonial is it wholly so, but evidently strictly and intentionally sanitary, and therefore not meant to be shelved as mere obsolete though curious antiquarian literature. Its advice is perennial, world-circling and profound. The physiological and sanitary science it contains, both in mass and in detail, is not only strictly accurate as read from our present standpoint; but is also suggestive of further and minuter development. It is pleasing to find man's modern deductions endorsed by the Divine revelations of Sinai so many centuries ago, and also forestalled.

Besides this law of a wise selection of food, several other sanitary dietetic hints may be gleaned from the Pentateuch and the history of the Wanderings. The important rule, of world-wide application, that of having just enough food, no matter what that food may be; and neither eating too much nor too little at one time, is shewn by Exod. xvi. 8, in which bread is spoken of as given "to the full." The same was indicated in public hygiene by the fall of Manna and of Quails, both of which were regularly apportioned (Ex. xvi. 13-18). Gluttony and excess, both in eating and drinking, are also strongly decried by the Mosaic hygiene; and deemed worthy of public condemnation, and even worse punishment, that of stoning to death (Deut. xxi. 18-21) when practised against parental instruction and advice; so absolute among the Jews was the power of parents over their children. God makes duties to parents next to duties to himself, and of the greatest political, social, and religious importance. It is also worth especial notice that God promised to bless the food and water of the Hebrews of the Wanderings (Ex. xxiii. 25).

The beneficial effect of this masterly law, a judicious selec-

tion of food, and ultra care in dieting, is clearly shewn by the healthiness of the Hebrews, especially in certain directions; and notably by investigations regarding only one disease out of many that might be adduced. Phthisis is a disease which kills about one-seventh of the human race. Its prevalence among the Jews is far less than among Christians of the same country or community; and it is both interesting and important to ascertain why. This doubtless arises from the care in selecting, preparing, killing, and bleeding only clean and unblemished animals for food. And the statistical fact shews that these precautions, which we often deem ourselves wise in discovering, were known and followed many centuries ago, not blindly but advisedly, as ordained by the All-wise. It also indicates the great sanitary acumen of the Sinaitic Code; the true explanation being possibly revealed to Moses as part of the Sinaitic disclosures. We find proof in the evidence of a commission not many years ago, when Dr. McLaurin, of Sydney, pointed to the remarkable fact that among the Jewish population of N.S. Wales, numbering 4,000, living mostly in towns, only one death occurred from phthisis in three years. Whereas, had that disease been as prevalent among them as among the rest of the very mixed population there would have been from 13 to 14 deaths. Can we doubt that the general freedom of the Jews from disease as a whole, as well as their healthiness, longevity, vigour, and permanence as a race, are all largely due to their judicious dieting?

The question of food supply leads to that of the capabilities of the Sinaitic peninsula for this. In that comparatively barren, little productive, and sparsely-peopled region, it would have been difficult or even impossible, even at that day when it was not quite so parched and depopulated as it is now, to have provisioned over two millions of people day by day, surrounded by hostile nations to prevent food supply from beyond, and soil cultivation close at hand. This difficulty however was overcome, and several important lessons taught incidentally by the miraculous and heaven-sent supply of Manna and Quails. But had that region any capability for vegetable or corn growing when long camped; or for pasture and water supply for their fast-increasing flocks and herds? What were the resources of the Wilderness of that day? The Hebrews were miraculously supplied with food and water; their clothing and sandals waxed not old, their bodies were kept healthy both by sanitary and miraculous means. How were they supplied with luxuries and change in the shape of fresh vegetables; and how were their cattle supported? The Desert is now and has been for many years little else than a barren waste, peopled with about 6,000 Bedouin Arabs. Was it then capable of supporting animal life, especi-

ally a host of human beings comprising, as did the Israelites, at least 600,000 males of war-like age; and a host of altogether over two millions of souls with such large flocks and herds, even if the latter were limited to what they took with them from Egypt; and all this in addition to the permanent population of the peninsula. Of the exact size of their flocks and herds at the Exodus, and that shared the fortunes of the desert with their owners, we are nowhere informed; save that at the end of the 40 years' wanderings two and a half tribes, namely Rheuben, Gad, and the half tribe of Manasseh, were the chief if not the only cattle-masters. Probably only a few of the other tribes possessed cattle on leaving Egypt: as the long and sore bondage must have interfered much with their favourite pastoral pursuits during the eighty years of Moses's life before the Exodus, a time when the majority of the Hebrews were not massed in camp, but "scattered abroad throughout all the land of Egypt" (Ex. v. 12), in pursuit of wholly different and absorbing though uncongenial labour, that of brick-making, city, and canal building. And, so throughout the Wanderings the same few tribes may have been the chief cattle owners. Were the mountain sides, and the wadys, and the plains of the different Arabian deserts through which the Hebrews travelled during the Wanderings, ever able to furnish greater dietetic resources for man and beast than now? And were what we now term "Wildernesses" as truly descriptive of their present state equally deserving of the name in former ages? No doubt the vegetation of that region, like that of Palestine, Babylonia, and Assyria, has considerably changed in character and materially decreased. The palm, acacia, and other trees have been ruthlessly destroyed. As a result the rain and water supply have correspondingly diminished; and with them the smaller vegetation. In Mosaic days that region supported the Amalekites, who were "the first of the nations," and perhaps the Amorites under King Arad. Native testimony shews that in very early ages this region was extremely populous; had many towns and villages, which supported themselves in some way by the produce of the soil: and that the furious rage with which the Arabs, both before and after Mahomet, assailed the Greek Emperors converted this blooming region into a waste; except where the fostering hand of man, and his economy and husbandry of Nature's bounty and copious rain supply has resurrected the latent resources of the still very fertile soil, and converted local spots into patches of the greatest fertility.

Clearly, therefore, certain great and important sanitary facts, often deemed modern, and especially regarded as Nineteenth Century discoveries, are plainly, though inferentially, pointed out in the Mosaic sanitary code regarding food and dieting: thus—

1. That certain animals and their flesh are healthy as diet, and therefore edible: while others are the reverse; and that not all of the animals created are meant for food.
2. That certain grave bodily diseases and other serious detriments may accrue from eating the latter.
3. That even certain parts of the edible animals are dangerous as food.

And thus, at least as far as dieting is concerned, the Hebrew Torah of Mosaic days is still the Torah of modern times; and in its broad outlines not theirs alone, but that of human kind and for all time.

Post-Mosaic Bible Hints Regarding Food and Dieting: Jew and Gentile: Bond and Free.

In other parts of the Holy Scriptures besides the Pentateuch we occasionally find pithy and practical hints regarding food and dieting: meant for the entire race.

The Christian dispensation annulled not the whole law, but only the temporary ceremonial part of it; and therefore that portion with which we are now concerned, namely, the dieting and division of animals into "clean" or food animals, and "unclean" or forbidden ones. Since then there have been no ceremonially or typically "unclean" animals. For, "what God hath cleansed that call not thou common, whether they consist of four-footed beasts, wild beasts, and creeping things, and fowls of the air" (Acts xi. 6-7). This clearly neither enforces nor prevents a wise selection of food animals and food such as the Mosaic code enjoined and human instinct has selected: especially as we find that scripture and science agree regarding the wisdom of selecting what the popular mind, savage and civilized, has found most healthy and palatable; and avoiding all that is unhealthy and unpalatable. There is nothing wrong or sinful if our individual taste leads or necessity compels us to eat things, animals, and parts of animals formerly forbidden, as is often done in various countries, even our own, where taste varies like our national manners and customs. It is only the *typical* part of this law which has been done away with. And if we consume carrion-feeding or predatory quadrupeds, birds, reptiles, fish, molluscs, or reptiles, we commit no sin and break no law, religious, Mosaic, or Christian. Or if we touch any of the bodies of these Mosaically unclean animals, living or dead, does it make us individually ceremonially "unclean," or necessitate a punitive penalty. Nevertheless, to eat such is unwise

sanitarily. Nor is the sanitary meaning and import of this ancient Sinaitic law of dieting annulled by the later scripture, or the trance and vision of the Apostle Peter; any more than it has been annulled or opposed by modern scientific teaching, prevailing instinct, and long established custom. Peter's vision only removes any disparaging ideas that the Hebrews or Gentiles may have conceived regarding the true place in creation, value, utility, and importance of these unclean animals. No animal can now be deemed unclean or common that has been stamped by the creative force of the Almighty: either in its living or dead state; although its flesh may not be so wholesome as that of certain classes specially created to be "food" animals. Nay, many of the Sinaitically "unclean" animals are Biblically quoted for good and even noble qualities. Thus the horse for his swiftness (Jer. iv. 13) and strength (Job xxxix. 19; Ps. cxlvii. 10); the ass for strength (Gen. xlix. 14) and dignity (Zech. ix. 9; Mat. xxi. 5); the lion as a national emblem (Gen. xlix. 9; Numb. xxiv. 9; Deut. xxxiii. 20; Rev. v. 5); and for strength (Prov. xxx. 30); bravery (2 Sam. xvii. 10); patience (Ps. x. 9); and righteous boldness (Prov. xxviii. 1). The eagle as emblematic of swiftness (Deut. xxviii. 49; 2 Sam. i. 23). The vulture for clear vision (Job xxviii. 7). The raven has Biblical prominence (1 Kings xvii. 4-6; Gen. viii. 7). The hawk for wisdom (Job xxxix. 26), and also the stork (Jer. viii. 7); and the serpent (Mat. x. 16). The worm for humility (Ps. xxii. 6). Even God's lowliest creatures must not be disparaged or despised, even by typical observers; seeing that, like ourselves, they were created for His uses, honour and glory; and that even the lowliest and "creeping things praise the Lord" (Ps. cxlviii. 10). Still, even Biblical commendation and prominence like this does not make their flesh more palatable, wholesome, or proper for continued dieting.

While New Testament and Apostolic teaching does not annul the Mosaic sanitary teaching regarding the proper selection of food and food-yielding animals, as given in Table V; this view regarding Peter's vision that this was sent merely to remove a misunderstanding, is confirmed by the direct and distinct renewal and advisory enforcement of several other parts of the same Mosaic law of dieting; *e.g.*, those which would be decidedly unsanitary and unwise to adopt. Thus, eating blood was prohibited the gentile converts by the Apostles assembled at Jerusalem, A.D .52 (Acts xxi. 25; Acts xv. 20; xx.). This was clearly to enforce the Mosaic law of old, because it was unsanitary and dangerous to make blood a staple article of diet; and not because it was against the ceremonial law. Eating things strangled were also forbidden, because not bled, and for the same sanitary reason alone as with blood. Things offered

to idols were also forbidden, for no sanitary or unsanitary reason; but to avoid countenancing and imbibing idolatrous customs. These Apostolic teachings, moreover, are a distinct confirmation of what was doubtless meant to be taught inferentially by the Sinaitic law regarding a judicious selection of food and food-yielding animals. And also of the prominent medical truth now fully recognized by professional minds; viz., that disease enters the human body by many different and occult channels and even microscopic inlets: the stomach and intestinal canal being among the most frequent.

After the era of the Pentateuch, although the Bible warns strongly against over-anxiety about what we shall eat or drink (Phil. iv. 6; Mat. vi. 25); and thereby inculcates not only trust in Providence, but also teaches indifference to gastronomic indulgencies: it does not give any very explicit, minute, or pointed rules regarding diet and dieting, or lays down general or particular laws like the Sinaitic, even to the Hebrews, but treats these subjects in a broad and general way. Still, the Scriptures contain other valuable hints that ought not to be ignored.

Little is found after the Mosaic rules regarding the *kind* of food we ought to eat, beyond the Sinaitic restrictions; but leaves its selection to natural instinct, common-sense, and Bible-teaching, already penned. Because, thus guided, we cannot far err in our choice. Solomon's prayer, "feed me with food *convenient* for me" (Prov. xxx. 8), clearly indicates the necessity for providing varieties suited for different idiosyncrasies, ages, sexes, seasons, and climates. We also find an indirect and inferential but very important hint regarding *infant* feeding, when we read of "milk for babes and strong meat for those of full age" (Heb. v. 14; 1 Cor. iii. 2). This law is often broken in two ways; as when the natural food is wrongly and unnecessarily supplemented or even supplanted by animal meat, or vegetable food, like bread, biscuit, arrowroot, and similar starchy articles, during the earliest months of life before the true starch digester, the saliva, appears. Though eagerly eaten, and with satisfaction, the child so fed is practically starved. Nature plainly suggests that for months an infant's stomach is unfit for stronger or other aliment than human milk or some rational substitute, such as cow's. In many cases again the mother's milk is continued after the eighth or ninth month, when stronger food should be given. Both reason and physiology indicate that after a certain period mother's milk becomes watery, weak, and unfit for the infant; while unduly prolonged nursing exhausts the mother by the unnatural drain.

About the *quality* of our food the Holy Scriptures do not give much advice, because it is unnecessary. For, while we

ought to "receive the meats that God hath created with thankfulness" (1 Tim. iv. 3), we naturally choose the best we can get or afford. At the same time we may observe that the Scriptures always speak of "fine" and "finest" wheat, and so forth, as the best and most desirable (Ps. lxxxi. 16; cxlvii. 14).

The avoidance of careless and the justifiability of judicious *cooking* to convert food into "savoury," that is tempting dishes, such as suits individual tastes, is also indicated by many Bible texts (Gen. xxvii. 4).

Regularity in dieting is clearly inculcated in accordance with our physiological requirements, when we petition for our "daily bread" (Mat. vi. 11); and pray that our food may be supplied "in due season" (Ps. civ. 27; cxlv. 15; Eccles x. 17; Mat. xxiv. 45; Luke xii. 42).

The latter subject has necessarily much to do with the *quantity* to which we ought to restrict ourselves, a matter in which most people are thoughtlessly apt to err, either by eating too often, or by taking too much at one time. On this subject the Bible does not often speak; but what it does say is particularly strong and pointed. And, although "the living God giveth us richly all things to enjoy" (1 Tim. vi. 17); and thereby constitutes eating one of the permitted pleasures of life: while the necessity for each person having enough food is implied in certain texts (Luke xv. 17; Exod. xvi. 8); we clearly do not require more than enough, because we ought only or mainly to eat for strength, that is, to sustain the body (Eccles x. 17). Still, people of all ages and conditions, the infant, adult, and old, the rich and poor, savage and civilized, are prone to the alluring habit of over indulgence in food. In nothing, therefore, have we more need for advice. The Scriptures make no remark about under-eating; that being a fault which few are likely to commit, or persist in so long as to be morbific. Neither is moderate festivity condemned, for Christ and his Disciples attended such: for example, the marriage at Cana (John ii. 1), and the banquet given by Levi (Luke v. 30). A sufficiency and no more is what is evidently commended by the Bible (Prov. xxx. 8). And the health-hint, "abstain from fleshy lusts" (1 Pet. ii. 1) clearly inculcates moderation in eating and drinking as much as in all other bodily desires and appetites (Prov. xxv. 16). It is not feasting so much as the temptations which beset it: and especially over-indulgence, which are so strongly decried. Moderation is advised, even in the apparently most harmless articles, such as honey (Prov. xxv. 27). Paul's hint is invaluable: "Meats for the belly and the belly for meats: all things are lawful for me, *but I will not be brought under the power of any*" (1 Cor. vi. 12). This clearly indicates the constant necessity for self-control with regard to this appetite.

Gluttony, especially over-eating of flesh (Prov. xxxiii. 20-21) is always decried, deemed as bad as drunkenness and riotous living (Deut. xxi. 21; Mat. xi. 19; Luke vii. 34), and is strongly warned against in the following terms: "When thou sittest to eat with a ruler, consider diligently what is before thee, and put a knife to thy throat if thou be a man given to appetite. Be not desirous of his dainties, for they are deceitful meat" (Prov. xxiii. 1-3). Although on cursory inspection these few sentences do not appear much, they evidently have a threefold meaning. Firstly, they do not only warn against sycophancy; but, secondly, against over-indulgence in the alluring pleasures of the table; and, thirdly, against the unvarying use of *dainty* food; lest it lead to surfeit and sickness. So that, like the handwriting on the wall, the importance of these Bible texts, hygienic and otherwise, is not discovered without careful study and interpretation after the rules of dieting. The sacred book assumes not only that we study its pages, especially its sanitary precepts; but also supposes that we individually take proper care of our health and life, and ascertain the general principles of judicious, that is healthy dieting. An individual who cannot control his appetite at a stranger's table, is even less likely to do this at his own board; and is thus constantly apt to overstep the bounds of prudence. So that the warning now quoted, read in the light of the previously mentioned physiological facts, really amounts to this. Seest thou one who possesses no self-control, who is a frequent and perhaps habitual glutton, and thereby often breaks the laws necessary for proper digestion of food in one and perhaps every particular, there is more hope of a fool than of him. And this, inasmuch as even a fool may be pliant, and will perhaps amend if persuaded. Whereas a stubborn glutton will neither listen to reason, nor alter his ways, and is therefore worse than a fool; because he is not only breaking God's laws, and therefore incurring his anger, but is injuring himself by wilfully tempting immediate disease, and thus persistently throwing away one of his best earthly blessings, health. Nay, more, to fare sumptuously every day, and live in luxury and idleness, is both to court and promote degeneration or disease of the brain and general nervous system; that is, of the noblest and most delicate of our tissues. This again is apt to be followed by a still worse outcome; namely, dwarfing of one of our most important birthrights, the intellect.

Furthermore, it will be apparent that these Bible hints on food and dieting are not only of personal, but also of great public, and indeed racial import. Thus it is clearly as important for the national as it is for individual health, vigour, longevity, prosperity, and happiness, to have a plentiful supply

of pure and unadulterated food. The evil effects of deficient, bad, adulterated, or improper food on large bodies of people, is well seen in the medical history of armies in the field, cities during seige, and countries during famine; when disease is not only very frequent, but also very fatal, and the general health much below par. While the opposite effect, of a plentiful supply of good food is equally apparent in the superior healthiness of the masses during periods of prosperity, when food is cheap and abundant. The great healthiness of the Israelites in the Wilderness was largely due to their carefully chosen and regulated dieting. And many of the Scripture texts above quoted are illustrated in the sanitary history of the Exodus and the Wanderings, no doubt intentionally and tuitionally. The proverbial vigour, health and longevity of the Hebrew race in modern times and in every quarter of the globe, as well as in Judea, is no doubt largely due to a judicious dietary after the Mosaic, Sinaitic, and Bible model. While the evil results of the reverse, a scanty and inferior dietary is often recorded in the many wars, captivities, and mishaps that befel them during the intervening period.

CHAPTER III

DRINK

"What shall we drink?" (Ex. xv. 24; 1 Kings xvii. 10; Is. xliii. 20.)

Mother Nature has bountifully supplied humankind with many different forms of fluid for quenching thirst. Of these water is the most prominent, universal, and best. Water is one of the most important of sanitary agents, not only for drink, that is for internal use, but also for cooking and for cleanliness, that is for external use. The latter object will be subsequently considered. Meanwhile we have to deal with the former, the use of water for drinking purposes. A due supply of appropriate fluid for this is one of the most urgent necessities of life. In this respect it ranks next to air in importance, and above food. A few minutes' deprivation of air will kill a human being; as will also a few days' deprivation of water; whereas under a deprivation of food we may exist many weeks. The reason will be readily understood.

The many different tissues of the human body, even the densest, invariably contain a certain percentage of fluid as an integral part of their composition. In some, for instance the bones, the proportion is small. In others, such as the blood, it is very large. Now the basis of this body fluid in every instance is water. Water thus constitutes from two-thirds to seven-eighths of the entire body. But, like the solid particles of the frame so also its fluid part, that is water is being constantly thrown off in the form of liquid or vapoury secretions and excretions. The fluid part of the human body thus thrown off has of course to be made up and renewed. This replenishment to replace this unavoidable waste is introduced mainly by the stomach; partly as free fluid and partly as an integral part of all solid food. And thus it happens that, from one standpoint water may be regarded as only a variety of aliment. Hence also why it is clearly Man's natural beverage. Humankind consume drink in many different forms, according to taste and supply. But water is the basis of them all. Their difference in colour, smell, and taste are due to their source. And, so important in this element in the human economy that pure

water has been allied with good food and fresh air, and called the tripod of life. This will shew the vast importance of water to Man. Fortunately, it is an article of which we never weary; and, moreover, one which nature everywhere bountifully provides for us. Water, or liquid in some form from which the body separates the water, is even a more urgent and constant necessity than solid food, not only to sustain, but also to develope the frame, and to enable it to carry on its many different functions.

The vast importance of water to humankind is shewn in another way; viz., by what follows a deficient supply or deprivation of it. Intense thirst, dire distress, and ultimately even disease follow a defective water supply. While the harrowing details of shipwreck might be adduced to shew what follows a more complete deprivation. The initial stinting of the supply causes thirst; which is followed by great lowering of the muscular strength and the mental vigour; the blood thickens, the tissues individually and the body generally shrivel and become increasingly torpid; till ultimately mania ensues, and death by exhaustion: because the many different bodily organs cannot carry on their functions without a constant supply and renewal of water. If this is not furnished they first flag and then finally stop.

Providentially, and of course intentionally, water practically abounds everywhere. Nature supplies it in three forms, viz., as vapour, liquid, and solid (snow, hail, ice): the formation and distribution of these being most interesting. As watery vapour it evaporates or distils from the surface of the land and sea. This rises and condenses in the upper air to form clouds, from which it is sent back to earth as rain, snow, and hail. These earth re-absorbs, and sends up again by spring, rivulet, and stream, to form lakes, seas, and oceans. By this complex process, involving changes of form, and distillation, percolation, and re-appearance, as vapour or liquid or solid, water is practically pure and unvitiated. But ere long it is apt to become contaminated and impure. First, by the air, from which it may absorb dust, smoke, and alien gases; or on or in the earth, from which it may dissolve salines or carry along mineral matters; or in rushing over land, where saline, mineral, vegetable, and animal impurities may be added: and thus the perfectly pure fluid which Nature bountifully distils may ultimately become exceedingly impure by foreign mineral, vegetable, or animal admixture. We thus have Nature supplying us with pure or impure water; or with soft, hard, or mineral fluid; or with healthy or unhealthy fluids to drink, according to the nature and amount of these additions.

But no matter whence we obtain our water supply; whether

from rain or springs, rivulets, rivers, tanks, canals, lakes, or reservoirs; it is essential that the fluid we get for drink and culinary purposes should be pure and abundant. Impure water is a very frequent and widespread cause of dire disease both in city and country, and in all latitudes, and among all peoples. For example, if water contains mineral matter in excess, such as iron, lead, &c., it may ultimately occasion headache, colic, palsy, goitre, and so forth. Again, vegetable matters in solution or suspended may cause diarrhœa, dysentery, ague, and other severe ailments. Of these impurities the most dangerous are the living, invisible, and microscopic animal and vegetable forms of life; and their still more minute and indestructible germs, spores, eggs, or seeds: inasmuch as by finding a suitable soil and nidus in the alimentary canal; or by being absorbed thence into the blood, and thence again deposited in the tissues, these occasion many troublesome diseases, malarial, infectious, contagious, and otherwise, which it is well to avoid if possible; which it often is. It is thus, as well as by the air, that cholera, typhoid, dysentery, yellow fever, typhus, scarlatina, diphtheria, measles, small-pox, and other contagious diseases; and also not a few non-contagious ones, such as dyspepsia, gravel, calculus, worms, and other ailments may originate in special sources of contamination of water with soluble or insoluble, inorganic or dead and organic or living substances. In short, it is thus by the agency of water and the impurities that may get dissolved or mixed with it that some of the most serious and deadly diseases known may be introduced into our bodies, and from us spread through our families, communities, the nation, and even the race; and by the subtle and often apparently inoccuous agency of which thousands may have their health impaired or perhaps lost. And it is well to recollect that, as with all other unsanitary agencies, water impurity is most danger-laden and likely to induce its special morbific effects when the body, and especially the alimentary canal, with which it first and chiefly comes in contact, is below par in health. On the other hand, when these are in full health and vitality, it is often marvellous how the vis hygienica naturæ enables the frame to ward off disease and drink water by no means very pure or healthy, with no obvious or permanent ill-effect. Again, it is also wise to remember that ordinary fluids, such as water, milk, and drinkables generally, are all more or less highly absorbent of dangerous morbific gases and dust-particles, microbic and otherwise, that may be floating in the air, and settle on their surface: and which moreover are, for obvious reasons, nowhere more abundant than in the atmosphere of sewer-traversed cities, private houses, and, above all, sick-rooms and hospitals; where the air contaminators are human beings, perhaps ailing ones. It will be obvious that

in order to prevent or minimize this danger, these and all other drinkable fluids should invariably be kept in a specially pure atmosphere till wanted. And, when in the room or home should be kept covered or in air-tight vessels, to prevent contamination from without and loss of their healthy aeration. So, also, water should also be not only carefully filtered but also boiled whenever its purity is doubtful. The boiling of milk before use is also wise; especially when disease is prevalent and dust abounds. It is too often by neglect of such sanitary precautions, arising from ignorance or indifference to their importance and aim that diphtheria, typhoid, scarlatina, cholera, and other of the most frequent and fatal diseases that afflict humankind are spread broadcast, especially by impure or morbifically tainted water or milk. Sterilized fluids are free from animal and vegetable germs.

But water is not only necessary for drink and to quench thirst and the constant waste of our frames; it is also indispensable for cooking our food. It is also required to promote the cleanliness of our bodies, clothing, houses, streets, sewers, &c. When the supply for these purposes is deficient, disease in various forms is apt to be indirectly induced. For example, sickness is apt to arise from the food being cooked in too little water; or in the same water more than once. Or, from our clothing remaining unwashed; or re-washed in the same water. Or by our houses becoming dirty; streets uncleansed; sewers unsluiced and therefore clogged: in one and all of which modes the air we breathe may become in various ways contaminated and disease-laden. From any one of which causes, or mayhap from all combined, a general lowering of the public health may result, and thus a widespread predisposition to disease, that only requires the appearance of some ailment to burst into flame and cause dire disaster. Hence it will be apparent that an abundance of wholesome pure watery fluid is a fundamental sanitary necessity, not only for individuals, but for communities and nations. These considerations combine to make the source of our private and public water supply, as well as its storage, distribution, quantity, and, above all, its composition, and freedom from animal, vegetable, and mineral impurities, matters one and all of the highest moment, and subjects that should not be overlooked, but diligently studied.

But from this two important questions arise. First, what is pure water, or, rather, what are the kind and amount of impurity which are consistent if not necessary for comfort and health? The only absolutely pure water is that which is distilled. Even if we could distil enough of this for human use, for drinking and cooking alone, distilled water is tasteless, unpalatable, and unfit for ordinary drink; besides being too pure and free from

certain ingredients in solution that give it flavour and make it palatable. Rain water is often the same; and so often, but less so, are many river and lake waters. These are all more or less what is termed *soft*. Spring and well water is, as a rule, the most pleasant and healthy water to drink; as it contains a small percentage of salines. When these are increased so much as to make the water *hard*, this is neither so pleasant nor healthy for a continuance. When the earth gives forth hot or cold water largely charged with gases, salines, and minerals, it is styled *mineral* water. Of these there are many kinds, according to the nature and amount of the matters in solution; none of them adapted for ordinary drinking or cooking; but very valuable medicinally. As a rule, it may be said that potable water should be clear, of pleasant taste, and devoid of smell. That which possesses these three characteristics may be deemed healthy.

Another important sanitary question is, what is the necessary or judicious quantity of water required per day per head? As regards this, a good rule is that every house should be so amply supplied that there is no stint for drinking, cooking, personal ablution, baths, clothes washing, house cleaning, and domestic sewerage. The average amount required per head for these has been estimated by Parkes at four gallons. But this is not sufficient for the daily ablution of the whole body, and for a proper supply of clean underclothing. And a safer minimum supply would be twelve gallons per head. The water supply for drinking is thus closely intertwined with that for cleanliness and other purposes; and must therefore be again spoken of under that heading. (Part 2, Chap. 7.)

People in almost every latitude and of every race make special forms of drink. This is especially the case with the more civilized nations, who benefit by their versatile inventiveness, and physio-chemical skill. To enumerate the many varieties of drinking fluids that exist even among ourselves would be unnecessary. Suffice it to say that the basis of them all is water. They may be divided into the non-alcoholic and the alcoholic. The non-alcoholic consist of water variously disguised, flavoured, sweetened, or coloured in various ways and in various degrees according to taste. With these it is obvious that care should be taken that the additions are harmless; *i.e.*, that they are not injurious to health, strength, and life. In short, that they should minister merely to quenching of thirst and gustatory gratification. On the other hand, the alcoholic drinks in which not only we but almost every nation under the sun, both ancient and modern, from the time of Noah who exceeded (Gen. ix. 23) downwards, have indulged in more or less; at least all enlightened and even semi-civilized peoples, is a

far wider and more important one, involving as it does the question of the healthiness and utility or the reverse of alcohol, is one that will be more fully entered into further on in the chapter.

Pre-Mosaic, Mosaic, and Post-Mosaic Hebrew Beverages

Before the Mosaic era the most important sanitary fluids mentioned in the Bible were three in number; namely, water, milk, and wine.

1. Water, so universally distributed, was the general beverage from the earliest times. The Biblical allusions to it and its various uses for drink and cleanliness are very numerous. Though not the first time it is mentioned (Gen. i. 2; ii. 6 and 10), the first allusion to it for drink is in the very pathetic story of Hagar and Ishmael in the Desert (Gen. xvi. 7), an index of the vital and sanitary necessity for fluid, and the healthfulness of that particular kind. Water and its source are often mentioned in the early Bible story, and that of the Patriarchs. Wells were dug at great expense *outside* their camps and cities; that is away from sources of contamination; and as they were difficult to preserve (Numb. xx. 17-19) were considered valuable property, and particularly essential in countries with flocks and herds, especially hot countries (Judg. i. 15). Hence the frequent strife and serious quarrels for their possession, involving important questions of property; as between Lot and Abram (Gen. xiii. 7), and between Jacob and Esau (Gen. xxvi. 22). In those warm, dry, and semi-desert regions, the Sinaitic Wildernesses, a liberal supply of water was especially necessary and grateful for Man, his flocks and herds (Judg. i. 15). Moreover, water in warm regions is the prime requisite to fertility and the growth of food for Man and beast. For then, in pre-Mosaic and Mosaic times, water and bread were the main supports of life in the East. In consequence of the paucity of showers water was then as it is now of great importance to the inhabitants. Hence why in Lot's eyes the coveted plain of the Jordan was valuable. It was well watered everywhere (Gen. xiii. 10), and adapted for his flocks. Where there were no streams they required wells. To name a well denoted right of property, *e.g.*, that at Beersheba by Abraham (Gen. xxi. 30-31). To possess one was a mark of independence (Prov. v. 15). A well-digger was thus deemed a public benefactor. Isaac was such, on account of his vast flocks; and no doubt dwelt near that of La-hai-roi (Gen. xxv. 11). Hence wells were valuable property and involved serious contentions. Many an important transaction and interesting conversation happened at

or near those wells, where the people, especially females, resorted in the evenings to draw water for home use and cattle. The Angel of the Lord met Hagar by a fountain of water in the Wilderness (Gen. xvi. 8): and subsequently opened her eyes to discover another which, in her anxiety, she had overlooked (Gen. xxi. 19). Rebecca may be said to have been betrothed to Isaac by the side of a well (Gen. xxii. 47; xxiv 15). It was and still is the custom with Oriental women, especially unmarried ones, to fetch water from wells morning and evening, and then adorned with trinkets. Isaac's servants strove with the herdsmen of Gerar about the possession of wells (Gen. xxvi. 20-21). Jacob first met his future wife, Rachel, at a well (Gen. xxix. 2) The pit into which Joseph was cast by his brethren was probably a dried-up well or empty cistern (Gen. xxxvii. 24). Possibly his Egyptian "dungeon" (Gen. xli. 14) was also a dry cistern or well. Moses met his wife, Zipporah, at a well (Exod. ii. 17). The great value of water and wells in those regions was forcibly shewn when they were stopped up or destroyed, that being either a military expedient, or a mark of conquest, or an encroachment on territorial right claimed or existing in its neighbourhood, and far the surest way to convert a flourishing country into an arid wilderness (Gen. xxvi. 15-23). For example, the Philistines stopped up Abraham's wells in hope of expelling Isaac from their neighbourhood; an encroachment which was stoutly resisted. To stop or destroy one was a mark of right claimed or conquest (Gen. xxi. 30-31). To abstain from the use of other people's wells was a disclaimer of interference with their property (Numb. xx. 17-19). And it is interesting to find that similar rights and customs exist in Arabia at the present day. These facts prove the great value of healthy potable water. Also that the Ancients were aware of this; and also knew how to get it.

The wells dug in the sand of the Arabian valleys were easily destroyed, and easily renewed, and often mark by their ready supply the stations where the Hebrews slaked their thirst, or were disappointed by its bitterness, as at Marah. Thus it is easy to understand how Bible wells have often become links in early history and landmarks in the sacred history, biography, and topography of Palestine, the Wilderness and People of the Wanderings. Once dug in a rocky soil, they might be filled with earth or stones, but not destroyed. Thus some wells are undoubted witnesses of the sacred history in which they have borne part; *e.g.*, the Wells of Beersheba, and Jacob's Well near Nâbulus.

In Palestine and Arabia wells are usually excavated from the solid limestone rock; sometimes with steps to descend into them (Gen. xxiv. 16). Their brim had a low stone wall or curb;

and a stone cover, as protections against accident, in accordance with law (Ex. xxi. 33). It was on a curb of this kind that Jesus long after sat and conversed with the woman of Samaria, probably of a well dug in Patriarchal days (John iv. 6). It was the stone cover which the woman placed on the mouth of the well at Bahurim (2 Sam. xvii. 19). The usual mode of raising water was by the rope and bucket, or the water-skin (Gen. xxiv. 14-20; John iv. 11; Exod. ii. 16). If the well was deep the rope was drawn over the curb by manual effort, or the aid of an ass or ox. Wells are and were usually furnished with wooden or stone troughs, from which animals or persons might drink. The Bible, moreover, even from early times, mentions and distinguishes between *wells* or receptacles for water springing up freshly from the ground; and cisterns, or reservoirs, usually used for rain water (Gen. xxvi. 19-32; Prov. v. 15; John iv. 14).

The Hebrews, during their 430 years' sojourn in Goshen had water in abundance from the Nile delta; and this, with milk, formed their chief beverage. But they left the first behind at the Exodus. Water was scarce and therefore precious in the Desert, and the earliest lesson of their Desert training was to make them feel at the end of their three days' journey in the Wilderness of Shur, where they found no water (Ex. xv. 22), how important water was in their daily life, and to whom they owed it. In Egypt they had undervalued this vital necessity; and possibly often forgat the giver (Ex. iii. 13). They probably never realized the true value of water till they lacked it (Ex. xvii. 2). Going on to Marah they found bitter water which they could not drink till Moses cast a "tree" into it that made it sweet (Ex. xv. 23-25). This has been explained by saying this was probably the Ghurkud, always found among brackish pools there, the bane and antidote being thus found side by side. More probably the result was still more miraculous. Yet to turn bitter into sweet water was even less marvellous than to turn water into wine (John ii. 3-9). This second lesson shewed the Hebrews the benefits of and necessity for pure and palatable water. And was the occasion of a well-timed homily and promise, in which Jehovah said he would put none of the Egyptian diseases upon them, and would heal them, if they hearkened unto and obeyed Him (Ex. xv. 26), and in this indicating that lack of water and the use of impure fluid would both engender disease. This episode was followed by the encampment at Elim with its twelve wells and abundance of that for which they craved; not milk or wine, but the universal beverage of humankind (Ex. xv. 27). Thirst of Man and beast having been thus appeased, hunger was their next trial and sanitary lesson, to be overcome by the gift of quails and manna.

Further on, at Rephidim, there was no water for the mighty host of humankind and cattle. This was given by Jehovah from the rock at Horeb (Ex. xvii.), which probably continued to supply them during the year they sojourned in that vicinity; in abundance and purity. There they learnt the sweetness of pure water from the rock, and the comfort of abundance. The wadys probably furnished streams and water during part of the rest of the Wanderings; and they may have come across wells from which the Arab tribes drank. Possibly they dug some themselves when long camped. But at Kadesh, in the Wilderness of Sin, they again lacked it; murmured, and were once more relieved by Johovah, who, by the rod of Moses, supplied water from the Rock (Numb. xx.). The fluid for which Nature craved was the healthiest and best they might have, or it would not have been supplied: and during the forty years of the Wanderings this model nation under Divine teaching, the Hebrews, chiefly drank pure water, supplied by Jehovah, an incontrovertible answer to the question are alcoholic drinks of any sort or strength an absolute necessity for humankind .

So, after entering Canaan onwards the principal drink of the Hebrews, as of other nations, ancient and modern, was water: and this when pure and cool was then, in the warm atmosphere of Judea, as it is now in our colder one, considered the most refreshing, healthy, and best of beverages (Job xxii. 7), and one of which we never weary, even in sickness, when most beverages are apt to pall. To acquire wells which they had not dug, houses and cities they had not built, vineyards and fields they had not tended, was, as it ought to have been, deemed a mark of special favour to the Israelites (Deut. vi. 11). To the Hebrew who came from Egypt, where he watered his fields and gardens "with his foot" (Deut. xi. 10); and to the forty years' wanderers in the dry wildernesses of the Sinaitic peninsula, where there were few living perennial springs; the land of promise "drinking water of the rain of heaven, a land of brooks of water, of fountains and depths springing from the valleys and hills" (Deut. viii. 7; xi. 11); and the springs and rivers and lakes of Palestine, the former short-lived, yet remarkable for their abundance and beauty, especially those which fell into the Jordan and its lakes; must have been a luring prospect. While to those who survived to enter the Promised Land they must have been a welcome sight. The extreme contrast between the fertile Promised Land and the dry desert must have made the Hebrew advent into the former all the more agreeable; and of this gratification the abundant supply of good water must have formed no inconsiderable part. They never had occasion again to murmur for water; and in Judea the supply was as great and the quality purer than from the muddy Nile. The land of

Israel was generally mountainous or hilly, therefore rain-making, and intersected by numerous brooks and streams (Deut. viii. 7).

In the later books of the Old and all through the New Testament there are many interesting allusions to water and its different sources and uses, especially for drink: and also their great value. Thus Caleb bestowed territory on his daughters with "upper and lower springs" (Josh. xv. 19), of a less parched locality. Nabal was chary of his water (1 Sam. xxv. 11). The psalms speak of a "dry and thirsty land where no water is" (Ps. lxiii. 1); the lack of water making the land of little value. The pools of Solomon beyond Bethlehem, a large work, were probably constructed for supplying Jerusalem with water; and not only for irrigating his gardens (Eccles ii. 6). Both oral tradition and the Talmudical writings ascribe to Solomon the formation of the original aqueduct by which water was brought to Jerusalem. Later on, Hezekiah stopped the water supply outside Jerusalem, "the upper water course of Gihon," in anticipation of an attack by Sennacherib, and brought it down straight to the west side of the City of David (2 Chron. xxxii. 30). We also read of Jeremiah being thrown into an empty miry cistern (Jer. xxxviii. 6). Israel was commanded to destroy the Moabitish country by stopping their wells; that people having to go elsewhere when the supply for themselves and their cattle was suspended (2 Kings iii. 19-25). Hence, also, why in Uzziah's time towers and castles were built to secure possession of valuable wells (2 Chron. xxvi. 10). Pilate applied the sacred treasure of the Corban to bringing water from a distance by an aqueduct at Jerusalem. This was either a new work or a reparation of Solomon's original aqueduct. The facts prove how much a plentiful supply of pure water was appreciated and sought after in Bible times: to be there recorded for tuitional purposes in sanitation and dietetics; for future ages and for us. In the east it was and still is considered a mark of hospitality and a great compliment to offer water to the weary (Job xxii. 7). Even a cup of cold water given in kindness to a disciple of Christ will be fully valued; and neither be unappreciated nor go unrewarded (Mat. x. 42).

In all of these cases from Adamic times downwards, water was spoken of and alluded to with purely social and national hygienic and dietetic aims: and Jehovah promised to specially bless the bread and water of His chosen people the Hebrews (Ex. xxiii. 25). At the same time the word and fluid are often used in the Bible all through for symbolic and typical purposes. Thus as typical of spiritual and moral and ceremonial cleanness of Aaron and his son (Ex. xxx. 20). Also in (Lev. xv. 12; Numb. viii. 7; xi. 32; xix. 9; Ps. xlii. 14; Prov. xx. 5; Is. xxxiv. 7). And that fluid which is so vitally essential to the

body and its mundane life, has been aptly used in the Holy Scriptures to typify that which is equally essential to our spiritual life, the water of life of eternity and its typical river (Rev. xxii. 1-17). So also thirst, the feeling which indicates the intensity of our need for water, is also used in the Bible to typify that craving which ought to animate our souls for that which is spiritual as indicated by the words "Ho ye that thirst" (Is. lxv. 1; Mat. v. 6).

Moreover, by the aid of water the Hebrews made certain palatable drinks with the fruits of the country when they had the requisite material; as in Judea; to a more limited extent in Egypt; and seldom or not at all in the Desert. Thus chief among these were: *a*, barley water; *b*, fig cake water, refreshing, and resembling modern sherbert; *c*, melon flesh and water, largely cultivated, and combined drink and food.

These facts in the personal and public history of the Hebrews and still earlier times, combine to illustrate certain important sanitary facts; thus—

1st. The ever-present and indeed vital necessity of fluid for the health and life of the human body; the inconvenience and danger of its scarcity or absence for dieting, cooking, to say nothing of cleanliness.

2nd. That water is the best of all fluids for the purpose; this being doubtless one cogent reason for its bountiful provision by Nature.

3rd. The importance and necessity for having it pure and of pleasant taste; not bitter like that of Marah (Ex. xv. 23).

4th. The necessity for having it in abundance. A deficient supply (Ps. lxiii. 1; 2 Chron. xxxii. 30), or a supply which is unpalatable (Ex. xv. 23), are both apt to ruffle the individual and national temper and progress, but also to cause disease as a sequel to discomfort.

5th. That where it can be obtained deep well or rock water springs are the best. Jehovah could easily have made water to flow from the sandy or pebbly ground as from the flinty rock; but he knew that the latter was less likely to be contaminated by what it flowed over or through, and thus all the healthier.

The sanitary prescience and wisdom of their Divine leader in providing a plentiful supply of the purest water for the altogether educational and partly punitive Wanderings, is especially noticeable. This region, the Arabian Peninsula, into the solitudes of which they had been purposely led, consisted mainly of mountains, such as the Sinaitic range, with intervening dry, sandy, or rocky deserts, such as those of Shur, Sin, Paran, and Zin; and a few narrow, more fertile and better watered valleys

or wadys, such as Arabah, Feiran, Bairak, Jerafeh, Khoran, Fikrea, Gherundel. These deserts and wadys had streams, but these were often soon dried in the hotter season; also springs and wells. The wadys for this reason soon became exhausted in the dry season. Near the edge of the desert water may often be found a very short distance, even a few inches from the surface; but it is often brackish, unpalatable, and unhealthy. The Sinaitic peninsula, moreover, was a sparsely peopled region; and the Hebrews, when camped towards its southern end or middle were far from the wells and springs made by their progenitors, the patriarchs Abram (Gen. xxvi. 15), Isaac (Gen. xxv. 11), Jacob (Gen. xxix. 2), Moses (Ex. ii. 17); and also from those of other nations (*e.g.*, Numb. xx. 19). In the desert water was scarce and precious; and wells were its chief supply. Hence, as already mentioned, why these were valuable property, and often bought (Numb. xx. 19), fought over (Jer. xxvi. 20; 2 Chron. xxvi. 10); protected by towers and castles.

As may be readily understood, the two millions of Hebrews and their flocks required a plentiful supply of water, not only for drinking and cooking; but also for sacrificial, ceremonial purposes; cleanliness; the frequent ablutions of the body, clothing, &c., required by the Mosaic law; but also for their cattle and sheep. After Mosaic times the ordinary Hebrew beverage was water from public wells and fountains (John iv. 6-7); which was refused to none. And the care taken not only by the earlier patriarchs, but also by the Israelites of the Wanderings, and those of settled Judea, to keep the source of supply and fountain pure, and removed from all sources of possible contamination; *e.g.*, filtering from abbatoirs, refuse heaps, outhouses, drains, stables, sheep and cattle pens, &c., is especially noteworthy and deserving of the closest imitation, even in this modern hygienically awakened age: and especially worth imitating in our village and even city sanitation; where wells are often very shallow and close to drains, refuse heaps, and even worse sources of contamination.

It would thus appear from a critical perusal of the Pentateuch; and not only from the story of the Wanderings, but also from the biographies of the patriarchs; that besides a knowledge of the immense importance of a plentiful supply of pure and palatable water to maintain health; the dire effects of water contamination as one of the most potent causes of disease was as clearly discerned, and was thus inferentially pointed out by the care that these early sanitarians unwittingly took of its full import regarding their water supply for all, but especially for drinking and culinary purposes. We have now or only very lately awakened to the necessity for this: although the discovery is often supposed to be altogether modern, and

indeed comparatively recent; although it was clearly indirectly pointed out in the Pentateuch over 3,000 years ago. A plentiful supply of physiologically pure water was among the many boons bestowed on the Hebrews of the Wanderings by their Divine leader in the Wilderness; nor was this the only important sanitary lesson he taught them directly and indirectly by means of water for dietetic purposes and for drink, during that memorable stage of their national history.

Clearly, therefore, the carefulness of this Heaven-taught nation, the Israelites, in having a plentiful supply of pure water, both for private and public use; and the necessity for keeping the fountain or source away from recognised and evident sources of impurity, is noteworthy and deserving of imitation in modern times; both when the main source of supply consists of ordinary wells as in villages; and where it is drawn from storage reservoirs and such receptacles, as in towns and cities. Both are apt to be contaminated not only at or near their source, but also during the downward flow of the fluid through tanks, conduits, and pipes: for example, by soakage of animal and vegetable matter from out-houses, dirt-heaps, cesspools, drains, and so forth. How often this occurs, and how much disease it directly and indirectly occasions at the present day, in the form of typhoid fever, scarlatina, diphtheria, cholera, and other dire ailments, is familiar to all medical men, especially officers of health. In this matter the ancient Hebrews were far wiser than ourselves. The supply per head also is often deficient in modern times. And while the upper and the middle classes have an abundance, the poor and the working classes, especially in tenement houses, who need it most, have often far too little. Much of the disease, contagious and non-contagious, prevalent at the present day, unquestionably arises from these two causes, namely, an impure or a deficient water supply. With the ampler opportunities and advanced mechanical genius of modern times, our water supply ought to be, and might easily be, practically unlimited both in town and in country; much more perfect than that of the Israelites even during the most flourishing phase of their history; and even than that of the Romans already spoken of.

2. Milk was another of the favourite Hebrew beverages first mentioned in the days of Abraham (Gen. xviii. 8). But as it is more of a diet than a drink it has been spoken of in Chap. 2 on food. The patriarchs were mainly shepherds, and Abram, Isaac, Jacob, his sons and their successors had it in abundance and close at hand from their kine, sheep, and goats. In the pastoral Goschen it would be equally abundant, at least during their prosperous days. Probably it was stinted during their later days of slavery and bondage. So it would also be at

first in the Desert. But later on they had much cattle and it would be again more plentiful. Possibly they would cook it with their manna. Later on, the Promised Land was one flowing with milk and honey; and there the plentiful and good pasture would make their own numerous flocks and herds, and those taken from the conquered and expelled Canaanites yield milk in great plenty for Hebrew diet; and the hills would thus figuratively "flow with milk" (Joel iii. 18; Josh. v. 6; xxiii. 8). Though, as a food, it was superior to water, because more nourishing, and even as a drink (Judg. v. 25); it is not so refreshing as a thirst quencher. That which Nature supplies and which infants instinctively desire and prefer is obviously their best food; and when good, nothing nourishes them better or supplies every element necessary for the growth of every organ and tissue in the immature infant body (1 Pet. ii. 2; Heb. v. 12-13). The chief Biblical allusions to milk were clearly and distinctly dietetic and sanitary. At the same time it was sometimes figuratively applied also (Job xxi. 24; Joel iii. 18)

3. Wine is another of the frequently mentioned Bible and Hebrew beverages: more frequently mentioned in the Holy Scriptures than milk, but not so often as water. While water is a beverage, and milk a fluid food, wine is a luxury. But the Bible attitude toward this product of nature is different from that towards the universal beverage and the fluid food. For while excessive indulgence in the latter too are never hinted at or objected to; in the former it is frequently mentioned. Sometimes we find the use of wine specially praised and advised in the Holy Scriptures, or at least not disparagingly spoken of. Thus it is called "cheering" (Judg. ix. 13): wine such as the faint may drink (2 Sam. xvi. 2); there is bread and wine for me (Judg. xix. 19); at the marriage feast in Cana Jesus converted water into wine (John ii. 3); wine formed a part of certain sacrifices according to the God-ordained Mosaic law (Ex. xxix. 40; Lev. xxiii. 13; Numb. xv. 5). Melchizedec, the high priest, brought wine (Gen. xiv. 18). We also read of wine for the faint (2 Sam. xvi. 2); for the heavy-hearted (Prov. xxxi. 6); wine that makes the heart glad (Ps. civ. 15); wine and milk without money (Is. lv. 1); wine for thy stomach's sake (1 Tim. v. 23). In other texts we find wine strongly disapproved of: thus wine is likened to the poison of dragons (Deut. xxxii. 33); named a mocker (Prov. xx. 1); overmuch wine was decried (Numb. vi. 3); figuratively it is spoken of thus, "the nations drunken of her wine" (Jer. li. 7); "we should never give ourselves to wine" (Eccles ii. 3); "in the early patriarchal days overmuch wine was decried (Gen. xlix. 12). The fact is wine was given by God as much as were water and milk; and in all

these and other Biblical quotations we may notice the prominence of two hygienic factors in its use, viz., the *quantity* drunk and the *kind* of wine we partake. And these texts prove that, unlike water and milk, the use of wine is beset with danger. Hence the warnings against being "overcome" with wine (Is. xxviii. 1; Jer. xxiii. 9; Dan. i. 8), and "transgressing" with it (Hab. ii 5); and of being given to it (1 Tim. iii. 3); and of "walking in excess of wine" (1 Pet. iv. 3). And it is with wine as with many other things, "all things are lawful for me; but not all things are expedient. All things are lawful for me; *but I will not be brought under the power of any*" (1 Cor. v. 12), and individual moderation should be our rule regarding its use. Because almost all varieties of wine contain something which neither water nor milk possess, namely more or less alcohol or spirit; a chemical which is stimulant in small quantities, soporific in larger, and poisonous in still larger quantities. The reason for this necessary difference of scriptural opinion regarding wine, and for the Biblical approval of it in some parts, and its disapproval in others, will be enquired into presently; and will be seen to be largely due to an erroneous conception of the different Hebrew words used to signify different fluids, but still one and all translated as meaning what appears to be one and the same drink, namely wine.

In the Old Testament vineyards are often spoken of among the blessings of the nation. The use of alcoholic beverages is of great antiquity. The first mention of them in the Scriptures is in the form of wine, and in the story of one of the most prominent of our Japhethic and of the Shemitic Hebrew ancestors, namely, Noah, who awoke from his wine (Gen. ix. 24) to find he had disgraced himself under its influence. In the private life of Bible personages wine was produced on occasions of ordinary hospitality (Gen. xiv. 18); at festivals and social events, such as marriages (John ii. 3); feasts, banquets, weanings, separation and re-union of friends, sheep-shearing, funerals, birthdays (Gen. xl. 20; Mat. xiv. 6). But as seven and sometimes fourteen days' feasting was not uncommon, especially for a wedding (Gen. xxix. 27; Judg. xiv. 12), a leading type of prophetic rebuke is the abuse of festivals and spirituous beverages to an occasion of drunken revelry, and the growth of fashion in favour of drinking parties. Indulgence is not wrong, provided it is on this side of abstemiousness and not beyond it. It was common among the Jews to use wine at solemn or religious celebrations, when all the males appeared before the Lord. The Egyptians indulged liberally in wine, as shewn by their monuments. It was therefore obtainable by the Hebrews in their prosperous days. Later on, during the "Wanderings," wine, for obvious reasons, could not be abundant in the Desert.

The vine was evidently not cultivated in the Wilderness; this industry or pastime being clearly incompatible with the conditions of that nomadic life. They sent to Eschol (Judea) for grapes. Still it was obtainable; and by the Hebrew law irreclaimable drunkenness was punishable by stoning to death (Deut. xx. 21). The use of wine at the Paschal feast was not enjoined by law; but had become an established custom, at all events in the post-Babylonian period. The cup was handed round four times, according to the ritual prescribed in the Mishna; the third cup being designated the "cup of blessing" (1 Cor. x. 16), because grace was then said. The contents of the cup are specifically described by our Lord as "the fruit of the vine" (Mat. xxvi. 29; Mark xiv. 25; Luke xxii. 18). Moreover, as already mentioned, wine was commanded for sacrifice, and as drink offering to accompany the daily sacrifice (Ex. xxix. 40). The presentation of the first fruits (Lev. xxiii.) and other offerings (Numb. xv. 5). This formed part of the Mosaic Law. On these occasions strong drink might be substituted for it, as was probably done by Nadab and Abihu, who were doubtless elated with wine or strong drink in some form when they unwisely "offered strange fire unto the Lord" (Lev. x. 1). Part of the punishment for this consisted in wine being forbidden Aaron and his sons when on active duty (Lev. x. 8-9); although it was evidently permitted them at other times. Nazarites were prohibited from using wine or strong drink or even grape juice during their voluntary vows (Numb. vi. 3). Tithe had to be paid of wine (tirosh) as of other products (Numb. xxviii. 7), and this had to be consumed "before the Lord," *i.e.*, within the precincts of the Tabernacle (Deut. xii. 17-18; Levit. vii. 16). The Priest also had to receive first fruits of wine (tirosh) as of other things (Deut. xviii. 4; Ex. xxii. 29), and a promise of plenty was attached to the faithful payment of these dues (Prov. iii 9-10). Still later on the fine and productive vines and vintages of Judea would give the Hebrews wine in excellence, abundance, and of the true kind. Its corn, oil, and wine were spoken of as gifts of God, and distinctive of a settled life. In Messianic times Jesus would not have miraculously changed water into wine for a first miracle, if that beverage had been in itself poisonous, malific, morbific, or in any way injurious when judiciously indulged in (John ii. 9). Nor would he have constituted wine one of the elements of the Last Supper (Mat. xxvi. 29) had it been dangerous. After His earthly career the pastoral epistles contain directions as to the *moderate* use of wine on the part of all holding office in the Church. They should not be "*given* to wine" (1 Tim. iii. 3), and thereby perhaps apt to be insolent and violent under its influence. This is repeated thus, "not given to much wine" (1 Tim. iii. 8);

"not enslaved to much wine" (Tit. ii. 3). The term "sober" means general vigilance and circumspection (1 Tim. iii. 2). St. Paul advises Timothy to be no longer a habitual water drinker, *i.e.*, a tea-totaller (1 Tim. v. 23); evidently because he had a local (stomach) or general weakness, and required a "little" wine as a stimulant medicine (1 Tim. v. 23). These rules are given as part of the great and comprehensive injunction, "keep thyself pure," applied to the Disciples generally (Rom. xiii. 13; Gal. v. 21; 1 Pet. iv. 3). And are meant as a warning, because intemperance prevailed to a great extent in these ancient times, and necessarily threw the Church and Christians into extreme danger by the force of bad example. In religious banquets the wine was mixed by rabbinical regulation with three parts of water. And, as it was clearly its *excessive* use or abuse which brought disaster on Noah, Nadab, Abihu, and other Bible personages, as with ourselves, it is clearly this which is warned against; especially as wine in Judea was deemed more a luxury than a necessity.

The wine and spirituous beverages used by the Hebrews or their ancestors were variously derived: thus—

1st. The chief source was then as now, the juice of the grape; either in its less artificial, original, simple, unfermented form, a sweet liquor, as expressed from the fruit directly into the cup (Gen. xl. 11), and containing no spirit; but sometimes boiled and so used (Gen. ix. 31); or in its fermented form as true wine, containing more or less alcohol. Another beverage, also sweet, was produced by macerating grapes. This was called the "liquor of grapes" (Numb. vi. 3). The wine of Judea, like its grapes, was fine and abundant (Numb. xiii. 23). Red wine was most esteemed (Prov. xxiii. 31; Rev. xiv. 20). Wine was preserved in skins called bottles (Mat. ix. 7; Job. xxxii. 19). The more intoxicating kinds, called strong drink, used by the wealthy, was shechar (Lev. x. 9). Shemer was the lees or dregs of wine. The chomets sour wine or *vinegar*, by itself nauseous (Ps. lxix. 21), used by the poorer and labouring classes to sop their bread (Ruth ii. 14), was really a weak, proverbially acid drink (Prov. x. 26), cheap and refreshing; made of wine or strong drink, which had undergone the second or acetous fermentation (Numb. vi. 3), and a good thirst quencher. Sometimes it was artificially made by mixing barley and wine, which then fermented and became proverbially acid (Prov. x. 26), and by itself nauseous (Ps. lxix. 21). It was similar to the Roman acetum or thin, sour wine consumed by soldiers.

2nd. Wine, both mild and strong, was also made from the juice of other fruits, fermented; *e.g.*, the pomegranate (Cant. viii. 2); apple wine or cider; melon, figs, millet, carob fruit, and various other fruits and vegetables, that supplied material for fictitious or home-made wines. Wine was also made from the date fruit; but this was different from the palm wine of modern Egypt, made by incising into the heart of the tree stem. Wine was also made from honey, of two kinds, viz., *a*, a mixture of wine, honey, and pepper; *b*, a decoction of grape juice like the defructum of the Romans, and similarly used, mixed either with wine, milk, or water.

3rd. Beer made of barley and herbs, lupin and skirrett for hops, was largely consumed in Egypt; and thence introduced into Palestine. Boozal of modern Egypt is made by barley bread being crumbled in water and left till it ferments. The Arabians mix it with spices. Chomets (Edumite) was probably another kind of beer, and to the Jews like our bitter beer to us.

Of these different varieties of wine, we find it only twice mentioned in the history of the Wanderings, *e.g.*, the simple, non-spirituous, unfermented, and pure blood of the grape (Deut. xxxii. 14); in other words, chemer or unclarified grape juice or must. It was doubtless this variety of wine that Jehovah desired as a drink offering (Ex. xxix. 4-6). This is still a much-prized luxury in modern grape-growing countries; but mainly used at home, as it easily and soon spoils. A spirit made from grapes is still imported from Palestine. Again, shechar or strong fermented alcoholic liquor is always spoken of in terms of disapproval; and forbidden to be used in sacrifice (Lev. ii.); or by the Priests (Lev. x. 9); or by the Nazarites (Numb. vi. 3); or by the people for ordinary drink (Prov. xx. 1-3; Is. v. 11-22). Doubtless it was this second variety (shechar), or strong wine, that Nadab and Abihu disgraced themselves with.

It will be evident that the judicious and wise use of wine and allied beverages, both now and in the past; and no matter what the form or name these may have, depends largely on two factors, namely, the strength of the particular variety we take, and on the quantity of alcohol we then and thereby consume. In moderate quantities this stimulates and cheers, and thus perhaps, under certain circumstances, may benefit us. In other cases it over stimulates, and may not only do pathological harm but lead us into other evil ways, moral, social, or spiritual. In still larger quantities it narcotises and may even poison or cause deadly pathological evil and disease. So that in considering

the entire subject, the percentage of spirit the different varieties of beverage contain; and the quantity each may individually and safely take of each variety, are all important questions. Therefore, in order to study the question of the use of wines and spirits, fairly and comprehensively, as well as their power over humanity and place in our dietaries, it will be necessary to consider them from three different standpoints, viz., 1st, as a food; 2nd, as a drink; and 3rd, as medicinal agents. Moreover, in furtherance of the special aim of these pages, we must also study, *a*, the secular opinion of modern medical experts: and *b*, what the Holy Scriptures say on the subject; to ascertain if recent ideas agree with or differ from those of ancient and Divine-revealed instruction.

A. Secular Medical Opinions Regarding Alcohol and Alcoholic Beverages

The use of alcohol and alcoholic beverages is so universally diffused among European and other nations as to be a matter of perennial racial interest. The wines and spirituous beverages of the present day are decidedly more numerous and varied than were those of Scripture times. Like the latter the former differ widely in origin, colour, taste, strength, and so forth. Yet they resemble these and also one another in having a common basis, namely alcohol. So that, to all modern and ancient, Jew and Christian, the health hints of the Bible on the subject of wine, and their correlation with our modern ideas, are obviously of equal importance.

The various kinds of spirit in present use, namely brandy made from wine, rum from sugar, whisky from barley rye, &c., and other varieties which, like these, consist mainly of alcohol, correspond in a major form to the "strong drink" and sheckar of the Bible, which was "raging" (Prov. xx. 1). Again, our modern wine, equivalent to the shemarin of Scripture, is of many different degrees of strength, and varies from the light French and Rhenish varieties, hock, claret, and so forth, that contain from 4 to 11 per cent. of alcohol; champagne with from 10 to 13 per cent.; up to port, sherry, Madeira, Marsala, and so forth, that have from 14 or 17 up to 21 or 26 per cent. Other favourite alcoholic beverages, such as cider and perry, have from 7 to 9 per cent. While the many varieties of ale, beer, porter, stout, and so forth now in use have from 1 to 8 per cent. of spirit. Kumiss has from 1 to 3 per cent.

The evil effect of these and similar alcoholic beverages when taken in excessive quantity is materially aggravated; and the good effect of smaller quantities is minimised by their frequent

and often great impurity. For, as well known, even the different kinds of spirit in common use, are often either manufactured from alcohol or adulterated, instead of distilled. While a not inconsiderable part of the wine annually consumed in some countries, especially the cheap varieties, contains only a very small proportion of grape juice; being manufactured, and subsequently fortified by alcohol. It has been shewn with regard to France, the oldest and perhaps most noted wine-producing country in the modern world, that it makes very little difference in her exportation whether there is a good grape crop or not; about the same amount being shipped yearly from her ports to wine consuming countries. For example, before 1878 her average annual vintage was 1,320 millions of gallons; whereas since then it has not exceeded 550 millions. Yet the wine consuming public has gone on drinking; all unaware of the deficit, which must have been made good by vile artificial processes, and by adulteration with inferior wines from other countries, or still more objectionable imitations. At the municipal laboratory of Paris, of 3,361 samples of wine analyzed, only 387 were pronounced good; while 1,093 were just passable; and 1,911 were decidedly bad. These, moreover, were wines for home consumption; and reputedly much better than those exported. The best of these were doubtless healthy enough; the second class harmless, or at worst injurious in a minor degree; but the third class of manufactured varieties were decidedly deleterious. Doubtless the wines of Germany, Spain, Portugal, Italy, and most of the European and other countries are often likewise equally impure and unsafe. From this the products of the younger grape-growing countries such as California, Australia, Cape Colony, and the less known European varieties, such as some of those of Hungary and Italy, anxious to come into repute and therefore desirous to maintain their character for purity, are as yet, and it is to be hoped will long remain honourable exceptions. The vintages of these countries are so abundant as to obviate the necessity for adulteration. Moreover, a large quantity of the so-called ale, beer, and other popular fermented beverages is also similarly manufactured or adulterated by the use of various drugs, such as quassia, strychnia, cocculus, indicus; and may contain neither malt nor hops.

With one and all of these many different varieties of alcoholic beverages, both the pure and the adulterated, the effect of course depends, as with the wines of the Bible, on the quantity used, its strength, and the frequency with which it is indulged in. A small amount of a mild alcoholic beverage may do little or no appreciable harm; but may even do some good. Whereas a larger amount, and especially a debauch, will do

infinite mischief by causing intoxication and minor poisoning; a result which becomes all the more injurious the more frequently it is repeated.

The very important question regarding the admissability or rejection of alcoholic beverages as an ordinary article of diet, or even as a luxury; and of the quantity of these, or of their active principle alcohol, supposed to be good for, or at least not injurious to health, cannot be satisfactorily settled without considering their physiological and other effects on the body; and settling the pertinent questions, are they noxious or innocuous; is alcohol, the basis of them all, a food, a medicine, or a poison. What therefore is the place of alcohol in Nature; and what the relation of alcoholic beverages to our human dietaries, our happiness, health, longevity, and our lives? Does physiology and its practical application hygiene, pronounce for the use or for the avoidance of alcohol and alcoholic beverages. Should we be total abstainers or temperate drinkers; and if the latter, what is meant by moderation and temperance, regarding these two terms as synonymous.

It will already be obvious that the real truth and vital question as to the benefit or mischief of spirits and spirituous beverages depends mainly on the chemico-physiological question, *what becomes of alcohol in the system?* This is therefore a problem both of great interest and import. Leibig, who regarded the matter mainly from a chemical point of view, thought it was destroyed there; and re-converted into heat-producing compounds; which served as fuel for the system. Unquestionably some, though only a comparatively small quantity, passes off unchanged, mainly by the breath, perspiration, urine, and other excretions, even when taken in ordinary moderate doses; and in still larger proportion when more deeply indulged in. By far the greater part of it, however, is split up and converted into other compounds, before being finally thrown off. But these are not organized ones, like these tissues of the body. In short, alcohol is never converted into living flesh, bone, blood, &c., &c. Even when it remains in these for a time it is entirely foreign and an intruder which is temporarily tolerated. Like some other chemicals, *e.g.*, common salt, sugar, &c., it is absorbed and thrown off unchanged.

To form a true estimate of the use or abuse, and of the real harm or value of alcohol and alcoholic beverages for humankind, we must first know their physiological and therapeutic effects on the human economy. This is exactly what we have not yet ascertained precisely; and there is still much difference of opinion even among professional minds. We have not yet been able to fully and with strict scientific accuracy, determine the destination and the rôle of alcohol after it passes into the human

stomach. When it does a person good, we cannot exactly tell how this benefit is effected. When it does harm, we are still much adrift as to the full rationale of the process. So that medical minds even are divided as to whether alcohol in moderate quantities is a food or a medicine or a poison.

Still we do know somewhat about it; and especially that it has three very different and distinct therapeutic results; mainly according to the quantity used. Thus:—

1st. If taken in small quantities it gently stimulates and tones for a short time, the brain, nerves, heart, and through these the entire frame and its functions.

2nd. In slightly greater amount it over-stimulates and semi-anæsthetises the body and all the functions are excessively increased, even to madness.

3rd. In still larger quantity or by repetition these results are succeeded by greater and more prolonged sedative, narcotic, and anæsthetic results, and ultimately by general paralysis both of sensation and motion. A large dose of alcohol is as complete a local and general anæsthetic as chloroform. Volition is wholly in obeyance; the strongest arm becomes powerless; the body like a log. The benumbing and deadening effect of alcohol is well illustrated by the miracle at Cana, "every man at the beginning doth set forth good wine," because the taste and other senses are then fresh, keen, and just," "and when men have well drunk then that which is worse" (John ii. 10), because then the palate and other faculties are less able to judge of quality. The primary stimulant as compared with the secondary sedative and the tertiary paralytic action of alcohol is nearly in the same ratio as with chloroform, opium, and some other well-known narcotics. Clearly, therefore, alcohol has both its value and its dangers, according to the quantity used. The main value lies in the former or stimulant action of smaller quantities: and the chief danger in the two latter, viz., the secondary or soothing and benumbing effect, and in the tertiary paralytic results. Its seductiveness consists in the pleasing facility of this speedily and easily obtained oblivion from obnoxious and unwelcome physical, moral, and mental sensations, so frequent in human life; and in the possibility of thereby obtaining a transient fore-taste or semblance, false though it is, of the happy future for which we all hope, and the peace and rest for which we often so ardently long. By it we banish thought and drown care for a time.

When applied externally, either to the skin or the mucous

membrane, it gently stimulates their function, but does not strictly enter into their composition. It thus gives them fresh energy to perform their allotted work for special occasions. Applied more strongly, it soothes, deadens, and narcotises them; and thus eases or annuls pain, itching, and other abnormal sensations. In still more concentrated form, or by longer application it physically shrivels, alters their structure, and impairs their function. On the other hand, if the vapour of alcohol wine, &c., is inhaled by the lungs, and thence absorbed into the blood: or, again, if it is absorbed into the latter through the mucuos coat of the stomach, it is carried by the all-pervading fluid to every part of the body, to do the same thing that it does externally. These facts go far to explain the varying good or evil effects of alcohol and alcoholic beverages such as we commonly use. A little stimulates us generally and may do us good under certain conditions of depression or fatigue of brain, muscles, and nerves. In larger quantities or by a repetition all the bodily organs and functions are deadened or benumbed and harm is done to the health. If this is constantly repeated, as by those who "drink," it alters the tissues physically and physiologically; especially certain of these for which alcohol seems to have a special affinity, or on which devolves the duty of excreting it, *e.g.*, the nervous system, kidneys, liver, &c.; thus originating what is termed organic disease or degeneration of different kinds. One prominent feature often produced is the alcoholic craving or habit; that alluring tendency to thirst for the baneful liquid; which grows as it is indulged in, and in which not only the palate, sense of taste, and stomach of the victim, but every cell, fibre, and part of his frame craves with mono-maniacal intensity for the accustomed stimulant, that is only slowly but surely disorganizing it, and leading the entire body to an early grave.

But modern physiology and pathology have gone still further, and traced the effects of alcohol on the human frame still more closely. And though the microscope has not yet pointed out its precise effect on the physical structure of the cell, the nucleus, nucleoli, and their vitalized contents and special functions; still we know some of its most prominent effects on the different bodily organs and functions. Thus:—

a Effects of alcohol on special organs.

1st On the *stomach.* Small doses stimulate the mucous membrane, and thus increase the secretion of gastric juice and peristallic action of the organ; thereby in both ways aiding digestion. Larger quantities, however, impair digestion by over irritating and congesting the stomach and coagulating the food. In still larger doses strong alcohol acts as a powerful local

irritant, corrugant, and congestant of the buccal pharyngeal and gastric mucous membranes, which it thus injures, and so reduces the secretion of gastric juice and the digestive principle, pepsine, by chemically altering them, thus affecting the digestive process, besides making the food less solvent, inducing dyspepsia, faulty assimilation, imperfect elaboration of blood, and many important secondary results that spring therefrom. In still larger quantities pure spirit may induce speedy death by reflex shock.

2nd. On the *blood*. The gastric blood vessels, especially the veins, having absorbed alcohol its presence lessens the oxydysing power of the red corpuscles, thus reducing the temperature. Thence it is carried to the liver and by the general circulation to every organ, part, and tissue in the body, which are thus apt to be affected detrimentally in function and structure by being either over-stimulated are narcotised. Even beverages containing 5 per cent. of alcohol completely derange the blood function; including general and local nutrition; and interferes with the function of different organs it supplies; *e.g.*, the brain for thought, nerves for sensation and motion, lungs for respiration, glands for secretion and excretion, muscles for motion, &c. Again, when it is often or always in the blood alcohol causes or leads to general and local accumulations of fat, and to fatty degeneration of organs.

3rd. On the *heart*, *pulse*, and *blood-vessels*. As a cardiac stimulant moderate quantities increase the frequency and force of these, by reflection through the gastric nerves. It may thus sometimes enable a weak or oppressed heart to draw on its reserve energy for special work; though not perpetually. But in disease it frequently slows instead of quickening the heart-beats, thus economizing instead of expending reserve energy. Larger quantities of alcohol induce the same stimulant, and then anæsthetic and paralytic actions, as they do on the rest of the body.

4th. On the *lungs*. Alcohol causes a diminished power of absorbing oxygen and exhaling carbonic acid; two all-important functions. Larger quantities over stimulate, then narcotize, and paralyze them as they do the heart by acting on and poisoning their nerve centres.

5th. On the *brain* and *nervous system*. Small doses of alcohol stimulate and exhilarate these. Larger ones intoxicate; still larger are toxic and paralyzing, first of the cerebrum and cerebellum, second of the spinal

cord, third of the medulla, the last being that which usually causes death (cerebro-spinal). By this the senses, feeling, tasting hearing, seeing, smelling, become blunted and finally abolished. The speech becomes thick, the gait and movements unsteady, the brain and intellect are blunted, the mental grasp is diminished, moral control lessened. The sympathetic nerves are also affected, as proved by the hot, flushed face, followed by cold, clammy, pale cheeks, all induced by blood-poisoning. Larger quantities of alcohol may induce speedy death by shock. Or death may ensue from paralysis of the medulla. The apparent immunity enjoyed by drunkards from serious detriment by accident, is due to paralysis of their nervous mechanism by which fatal shock is usually induced, which leaves the system as inert as a log. The sad effects of deep indulgence in alcohol and alcoholic beverages chiefly manifest themselves on the delicate and highly organized nervous system, in which many diseases may ultimately arise, *e.g.*, epilepsy, chorea, mania, imbecility, mental debility, insanity, various suicidal tendencies, minor nervous disorders, hysteria, dipsomania, &c., &c. Moreover, these are apt to be transmitted from errant father or mother to their children, even to the third and fourth generation of humanity, ruined by their own or their ancestors' drinking habits; all of the higher forms of manly and feminine nobleness having been wrecked and eradicated by their besetting vice. This is plainly shewn by the statistics of prisons, hospitals, homes, and lunatic asylums.

6th. On the *liver*. Small doses increase its function and the secretion of bile. Larger ones repeated tend in time to induce fatty liver or to shrivel that organ.

7th. On the *kidneys*. Their function is increased and the amount of urine by the additional fluid absorbed and the stimulation of the alcohol; especially gin, whose oil causes increased diuresis. Long continued excitement and increased function, however, tend to initiate nephritic disease.

8th. On the *skin*. Alcohol in small quantities dilates its capillaries and blood-vessels, thereby warming the surface at the expense of internal organs. It is thus injurious to individuals who take it during exposure to cold; though beneficial after exposure, as tending then to prevent congestion of internal organs.

9th. On *special tissues*, small doses, carried everywhere by the blood, excite and increase their functions; this occurring to every cell and fibre in the body. Larger doses tend to anæsthetise and ultimately paralyze them, as above stated. Long continued use of alcohol tends to cause fatty accumulation and degeneration in some.

10th. On special functions. Small doses of alcohol increase these by exciting the different cells and organs and blood-stream thereto. This aid is sometimes invaluable. Larger quantities deaden and ultimately paralyze them, and ultimately cause pathological disaster and disease.

b Effects of alcohol on the body generally. Small quantities carried over the body by the blood necessarily stimulate and excite every organ, function, cell and fibre in the frame. In this manner in health or in depression, it comforts, cheers, and does good by calling forth, facilitating, and aiding mental and bodily labour or strain; supplying easily kindled and consumed fuel for the respiratory fire; easily assimilable stimulus to the nervous and muscular tissues; lessens the necessity for ordinary food by diminishing the waste of the system, which requires food to repair it. Some form of alcoholic beverage may thus be occasionally of use for the poor and the half-starved. But when these are constantly or frequently in the blood they are apt to cause an abnormal accumulation in different regions of fat, and fatty degeneration of the different organs. The latter results accrue by the chemical decomposition of alcohol, and its reconstruction as fat. Alcohol and alcoholic beverages may thus prolong life when on insufficient diet by becoming indirectly a species of food. The continued indulgence in alcoholic beverages in considerable doses is apt to allure by accustoming every part and cell to the stimulus until so inured to the unwise excitement that these crave for and cannot live without that mistaken alien pabulum, the continuance of which only adds evil to evil, and fuel to the fire of advancing disease.

So far, one thing will be abundantly evident; viz., that while an occasional moderate indulgence in alcohol or alcoholic beverages; and even their daily moderate use may not only do no harm, but under certain circumstances may even do the body temporary or permanent good: their constant use in larger quantity may perchance injure us, in some cases soon and in others later on, even though this does not convert us into drunkards, by injuring and degenerating the tissues in structure and function; thereby deteriorating the health, strength, and intellect. And that a long indulgence in larger quantities is still

more hurtful to health, strength, and vitality, by acting as one of the most destructive and insidious of all morbific agents; and especially hurtful to the liver, lungs, heart, blood, brain, kidneys, stomach, and bodily tissues generally; especially if the hereditary tendency to drunkenness is present. For in few things is heredity more evident than in this. Longer and oft-repeated drinking is still more speedily morbific; the liver heart, connective tissues become affected with fatty accumulation; the blood vessels diseased, liver, kidneys, and meninges chlorotic, blood and general nutrition usually disordered. In fact, a drunken man is an ailing or diseased individual, indeed a criminal, and an infringer of the sixth commandment, inasmuch as a persistent drunkard is surely, though slowly, committing suicide, and throwing away his health, vitality, and life. It must be known that the deleterious or beneficial effects on the body are often so very slight as to be difficult to detect and differentiate, especially as they are often shewn in a great variety of form in different persons.

These details will be sufficient to shew how widespread and severe are the effects, especially of large quantities of alcohol, on the human body. The first stage of alcoholic action, the stimulant and tonic may be and often is beneficial both in health and in disease. In health when the frame is weakly as a philip or aid to spurt faulty, general vital action. The later, second, or over-stimulant stage of alcoholic indulgence; with its weakened nerves and brain, stammering tongue, blurred or double vision, incordinate and semi-sensible hands, legs, and body; are clearly injurious, especially if oft-repeated. The third, toxic, and latest stage, with its insensibility and semi-paralysis, is decidedly wrong.

But now the further question remains; is even the early or first of these stages hurtful or not, is it physiological or pathological? And is the small quantity of alcohol necessary to induce its characteristic symptoms admissible hygienically; and if it is, how frequently? This amounts to repeating the former question, is alcohol in small doses a food, a medicine, or a poison?

1. Alcohol and alcoholic beverages as foods. A food may be defined as whatever contributes by digestion and assimilation to build up and replace the constantly wasting tissues of the human body. In this sense alcohol is not a true food, like bread and beef: because it is altogether foreign to the highly organized and vitalized body, and its exceedingly delicate tissues, of which it never becomes an integral part, but ever remains an alien or foreign body. The inorganic elements of which it consists are not and cannot be rearranged, organized, and integrated by the body and applied to its uses, constructive

or otherwise; even although they may be, as they sometimes are, utilized for its functional purposes. It enters, passes through, and is eliminated from the body unchanged, and therefore will not alone support life. But still, in a minor sense, it may be deemed a food-adjunct: inasmuch as, when taken into the stomach it contributes either directly or indirectly to the sustenance of animal life and the maintenance of vital phenomena, by aiding digestion and the assimilation of true food. The only part of the usual alcoholic beverages, such as wine, beer, &c., that can be truly deemed food products are feeble ones, viz., the sugar, albumen, and empyreumatic extractives. These often unquestionably do the frame good, both when it is in full health and when it is ailing. Although physiologists have not yet been able to discover how these do nourish, or to trace their transmigrations in the process. It is undeniable, however, that men have been kept alive, in moderate health, and comfort, with no remarkable ennervation, on alcoholic drinks alone. And nothing is more certain than that people may live on alcohol for long periods if this fluid is combined with that other all-important food and prominent body-constituent, water. Moreover, the bracing and cheering effect of wine is not in proportion to the amount of alcohol in it, but to the saccharine and flavouring principles. So also of beers, cider, &c. Their additions belong more to the food class than does the alcohol.

2. Alcohol and alcoholic beverages as luxuries.

These physiological, pathological, and therapeutic facts clearly prove that the different alcoholic beverages we use are healthy, or at least harmless, or are decidedly harmful, either in health or in disease, according to the amount taken, *i.e.*, according to the effect produced on the individual, whether this be the first, or stimulant; the second, or intoxicant; or the third, toxic and deadly quantity. The following table (6) will therefore be useful, inasmuch as it shews the percentage of alcohol in the chief varieties of beverage containing that fluid chemical. And proves that while pure spirits contain most alcohol; wines contain a smaller percentage; and beers a still less.

TABLE VI

To shew the proportion of Absolute Alcohol in different Beverages.

Variety.	Proportion.
Brandy	2¼ oz. = 1 oz. Alcohol
Whisky	,, = ,,
Rum	,, = ,,
Gin	Usually weaker
Port	5 or 6 oz. = ,,
Sherry	,, = ,,
Madeira	,, = ,,
Marsala	,, = ,,
Champagne	10 oz. = ,,
Burgundy	,, = ,,
Claret	12 oz. = ,,
Bordeaux	
Strong Ales (Burton)	,, = ,,
Pale ,,	16 oz. = ,,
Porter	25 oz. = ,,
Stout	16 oz. = ,,

And if we keep in mind that the maximum amount of alcohol that a man can take daily without injury to health is what is contained in two ounces of brandy, a quarter of a pint of sherry, half a pint of claret, and one pint of beer; and remember that that is the adult limit, we may, from this table, safely reckon how much of each we may safely and wisely use, either as a stomachic, stimulant, or nutritive; and where we must stop if we would avoid the hurtful toxic and even deadly effects of alcohol.

Still, no definite rule as to quantity can be thus laid down on hard and fast lines, either in health or in sickness, as to the quantity which may or should be taken on the side of safety. And each case must be judged on its own merits. The given figures will not suit every case; and are merely approximative. Many things combine to make us alter these either on the side of increase or decrease. The estimate is made for healthy, active Anglo-Saxon adults, and for a temperate climate. And hence allowance has to be made for the following factors: viz.—

a For the kind and strength of the beverage, and the quantity taken. These are obvious points that require no comment. If we change the variety we must reckon the relative strength and different effects of each kind.

b For the age, sex, constitution, temperament, idiosyncrasy. The young bear alcoholic beverages badly: the mid-

aged can stand more, and better bear its absence: the aged often require them to support heat and the flickering flame of life. As a rule males can stand more than females; and better bear their lack when required. Strong constitutions can bear them better than the weakly. Sherries, Madeiras, and champagne are stimulating and better for the strong; port wines are valuable to stimulate and strengthen invalids. Certain idiosyncrasies cannot stand certain alcoholic beverages, or none at all. So also temperament is an important factor in the choice, especially of wines. Phlegmatic people should drink white wines, as they promote physical and mental activity. Nervous and excitable temperaments should drink clarets and red wines; which soothe the nervous system and body. Sanguineous and full-blooded people should avoid strong, red and fortified wines.

c Obviously also the character of the food should largely harmonize with the spirit, wine, or beverage used.

d The habits and mode of life are important. The active can take more than the sedentary, as they work it off.

e Country or town, land or sea life, must be considered. Country and sea life give more air, energy, and ability to bear more alcohol.

f The nature of the work is also important. Persons whose mental and nervous systems are much taxed, and their digestive processes therefore lowered, need it more than those accustomed to great physical exertion, which usually increases both digestion and nutrition. If a man is taking full exercise in the open air, more alcohol can be taken than when living quietly and at home. Those at heavy work can stand more than if at light labour, and especially "spurt" work. A combination of circumstances often enables the body to stand more, *e.g.*, active exercise or work in the open air, and country life. These confer a triple advantage and make people more tolerant of alcohol than town dwellers and the sedentary.

g For the race and climate. Civilized races can bear alcoholic beverages better than savages, whom they madden. So those of the Arctic and Antartic can bear them better than natives of the temperate zone; and the latter better than those of the tropics. In cold seasons we can take more than in warm ones. Race, climate, season, and temperature are thus important factors in the alcohol question.

h The result aimed at is another factor; whether this is tonic, stimulant, sedative, &c.

k The condition of the body at the time is also important. Persons unaccustomed to alcoholic beverages when well often stand large quantities when ailing.

l The relation of the individual to alcohol, and whether he is inured to it or not also affects its exhibition. In diseased conditions both those which arise from and those which do not arise from alcohol, it is often a question whether the stimulus should be partially or entirely stopped.

Clearly, therefore, there are many side issues that seriously complicate the matter. For not only is the body, with its numerous organs, parts, and functions different in each individual, but different individuals are differently affected by the same kind and quantity of beverage under precisely similar conditions. These many factors necessarily make the whole subject of the use of alcoholic beverages a very complicated one; nor is the great diversity of opinion on the subject surprising. However, although precision is impossible at present, the following remarks may be favourably received on the subject of alcohol and alcoholic beverages; the public being divided into the following three classes, viz., *a*, total abstainers or teetotallers; *b*, temperance or moderate users; and *c*, over indulgers or drunkards. Most people will grant that both from the physiological, the pathological, the hygienic, and every other standpoint, social, moral, and spiritual, the excessive use of intoxicants is morbific and in every sense wrong. The controversy is therefore confined to matters affecting the first two classes. At the same time it is well to understand how excessive alcoholism hurts. This is indirectly shewn by their baneful effects on the body. The alcohol in beverages is absorbed by the stomach into the blood. In an ordinary drinking debauch consciousness is lost, and with it the power to drink more. Nature thus fortunately steps in before the proportion of alcohol in the system has arrived at the fatal dose. Dead drunk is a condition in which the amount of alcohol in the circulation has reached to 1 part in 195 of blood. It is at this stage that most drunkards cease drinking. When the amount reaches 1 part in 100 of blood, as occasionally happens when a very large quantity of alcohol is quickly swallowed at once, death ensues. The alcohol in such cases kills by acting directly on the constituent elements of the blood; or by acting on the nerve centres, causing narcotic poisoning and rapid death by coma. To court these is folly; nay, it is madness.

When taken in smaller doses than this it may also induce very serious disease of various kinds, such as delirium tremens,

dipsomania, acute or chronic alcoholic poisoning. So, also, certain diseases that usually spring from other causes are sometimes originated directly by alcohol: for example, alcoholic phthisis, gout, paraphlegia, &c. Alcohol also contributes largely to the causation and issue of fatal frostbite and sunstroke after hard drinking. In smaller quantities causing intoxication it is usually followed by acute congestion and catarrh of the alimentary canal, especially the stomach and duodenum. No less than twenty-four different diseases can be traced directly or indirectly to the use of alcohol and spirituous liquids of various kinds, taken beyond their physiological limit.

Moreover, pathology proves that although alcohol and alcoholic liquids in prolonged excess, that is in narcotic quantities, may for long have no very tangible injurious effect on unusually strong frames, they are slowly but surely morbific in the majority of cases, and certain to deteriorate not only the different organs and tissues, but also the body generally. Their deleterious nature is shewn by the fact that when taken above a certain quantity the alcohol remains unchanged, and is thrown out of the system as useless for body wants or work. While under their influence the senses are blunted; the power of thought is lessened; the nerves and sensibility are deadened. The heart's action and pulse are unduly accelerated. Lung work is lessened; chronic bronchitis and asthma being thereby induced. The liver is subject to ill-timed and irregular excitation, which may subsequently cause enlargement and disease. The warm glow felt in the stomach after drinking is a pathological sign and a warning of mischief that arise from irritation of the nerves, and then of the delicate mucous membrane which lines it becoming reddened, congested from increased circulation; and in cases of persistent drinking, permanently inflamed and the seat of chronic catarrh. With this there is increased capillary circulation, especially in the skin and head. From this again there result impaired digestion and assimilative power, and a craving for a self-engendered want. For disturbed conditions of absorption and secretion of the gastric mucous membrane the effect of alcoholic fluids proceeds even to complete interference with digestion. Buchner's elaborate researches shewed that alcohol up to 10 per cent. has no influence on artificial digestion. But, added up to 20 per cent, it retards it. In a little higher percentage it puts an end to it. Undiluted beer stops it entirely. When diluted with water it hinders it. Red and sweet wines act similarly. Diluted white wine retards, and does not suspend it. Beer and wine, according to this, appear to act unfavourably even in small quantities, on natural digestion. The blood-vessels become relaxed, and the capillaries paralyzed: and thus the chemico-

physiological nutritive and excrementitious changes constantly going on between the blood and the tissues are interfered with or arrested; causing, among other things, a fall of temperature. Thereby not only by direct but also by indirect action on the tissues, the development of fat is increased; the activity of the voluntary muscles is diminished and molecular and fatty degeneration of the more highly organized tissues, such as the brain, nerves, muscles, and secreting cells, results; the different organs slowly decay, and their vital functions are depressed. Each fresh resort to alcohol is followed by new excitation, and this again by increasing depression. The chemical composition of the blood itself is altered; the normal changes in its corpuscles are altered; from which flows an injurious influence on tissue nutrition; increasingly lessened absorption and assimilation of food; and by an alteration in the calibre of the blood-vessels from special action on the vaso-motor nerves, and often by degeneration of their coats, and frequently also of the central motive organ or pump, the heart. In a direct manner this blood change alters the nutrition of the cells and fibres of the different organs and tissues, and degenerates them, while blood impurity follows, from retarded elimination of effete matters, especially of carbonic acid, uric acid, and urea. One primary disorder or disease thus leads in this as in other morbid processes to another, in unimpeded and unfailing pathological sequence. Nor is it surprising that, when every organ, tissue, fibre, and cell in the body has thus become poisoned physically and disordered functionally, the habitually intemperate individual either becomes a confirmed invalid, weak alike in body and brain; and sooner or later succumbs to some one or other of the many diseases induced thus, and as an ulterior result of intemperance and its baneful effects.

Among the underfed poor, with otherwise impoverished blood, flesh, and strength, these evils are greater and speedier. The result being tissue degeneration at compound interest from deficient food and alcoholic tissue poisoning; from which there follow impaired strength, inferior work, shortened hours, diminished wages in an ever-increasing ratio. These facts, based not on theory but on experience, and therefore all the more trustworthy, prove that the habitual use of strong, moderate, or even the weaker alcoholic beverages, such as ale, porter, &c., in excess, are hurtful to the physical, as they also are to the mental and moral constitution; and certain to cause ultimate deterioration of the frame, individually, nationally, and racially.

Moreover, an additional and great responsibility rests on the intemperate drinker. For no fact in the law of heredity is more fully established than the transmission not only of the obnoxious

habit; but also of the diseases to which it predisposes. The offspring of the drunkard and that of even the moderately intemperate are more prone than others to become drunkards themselves; and to be subject to rheumatism, gout, and various other diseases occasioned by erroneous fluid feeding, and therefore to an increased morbidity, mortality, and shortened lives (Jerem. xxxi. 29; Lam. v. 7). Thus, the iniquity of the fathers and mothers may be visited upon the children even to the third and fourth generation (Ex. xx. 5); entailing such results in the future upon the innocent unborn that even the most hardened sinner may turn from the prospect of such a crime with horror and dismay. This has been shewn by Dr. Howe, who ascertained the habits of the parents of three hundred idiots. Of these 145, or nearly one-half, were habitual drunkards. So also to the same cause, heredity, we may trace the inheritance of morbid appetites, which are far more constant and certain in their descent that patrimony. Morally and socially, excessive drinking has its evil results in a loss of mental power, self-respect, lowering of ambition, fading of hope, and general degradation. This may happen even when the habitual use of alcoholic or fermented liquor falls far short of what is necessary to produce intoxication; as shewn by blunted perceptions, impaired judgment, irritable temper, dulled spiritual vision: heart, mind, and body being alike impaired under the too elastic conventional term of what is falsely called moderation; which includes habits that are steadily despoiling the life of its rarest fruits.

No fewer than 500 dead bodies are in the course of a year sent to the New York Morgue. Indisputable facts shew that the mischief which has sent four thousand of those women there came from drunkenness. The statistics of lunatic asylums, prisons, hospitals, poor-houses, &c., also shew incontrovertibly that a large part of the crime, insanity, disease, death, and poverty arise directly or indirectly from intemperance, which acts on its deluded votaries in many different debasing modes. A former Bishop of London has stated that out of 1,271 maniacs whose former histories were investigated, 649 wrecked their reason by excessive drinking. The remarkable increase of insanity in recent years may also be in part traced to the prevalence of intemperance in beer, wine, and stronger liquors; which act on and disorder the brain more directly than any other organ; and by habitual action induce permanent impairment of the mental faculties.

Teetotallers seldom apply for parish relief. Whereas in Edinburgh, out of 27,000 cases of pauperism no fewer than 20,000 were traceable to drunkenness. In London the estimate amounts to two-thirds of the paupers. It has been asserted

that at least seven-tenths (7-10ths) of all the crimes of poverty and calamity to the people of the United States spring from the abuse of personal liberty in malt, vinous, and spirituous liquors. The statistics of some other countries are even worse than this. Good health, long life, social happiness, moral purity, spiritual uprightness, cannot dwell in association with a poisoned body, mind, and an upbraiding conscience, such as the drunkard has.

The morbific effects that alcoholic beverages may have is also shewn indirectly and in a very forcible manner by contrasting their influence on morbidity and on morality of those who abstain from and those who indulge in them. Thus the Government returns of the Indian Army for 1849 shews that the deaths among abstainers were 11·8 per 1,000; among the temperate 23·1; and among the intemperate 44; thereby shewing that the mortality among the temperate was doubled, and among the intemperate quadruple that among total abstainers. Again, the hospital admissions of the abstainers were 10·7 per 1,000 less than those of the temperate, shewing that the diseases of the former took a milder form. Similar testimony is derived from a contrast of the sickness of abstaining and non-abstaining friendly societies. Thus the average sickness per annum of the Temperance Sons was 7·48 weeks; of the City Oddfellows 26·26; of the Rural Oddfellows 24·68; and of the Foresters 27·66. Moreover, insurance companies are so satisfied of the superior healthfulness of abstinence that one had paid the abstainers insured 23 per cent. additional bonus; and another offered an extra bonus of 20 per cent. The United Kingdom Association shewed a 17 per cent. lower death-rate in the abstaining than in the general section.

In contrast to this we may quote that in Glasgow there was a sudden increase of nearly 1,000 deaths in the year that the lowering of the spirit duties began to operate. The influence of alcohol on the death-rate is well illustrated in the Registrar-General's report for 1880. This shews that in every class of disease, except one, the mortality has steadily decreased. In this one the principal increase had been in deaths from diseases of the brain and nervous system, organs of circulation, respiratory organs, liver and kidneys. These are precisely the organs most apt to be seriously affected by indulgence in alcohol. The annual deaths from personal intemperance in Great Britain has been estimated at from 40,000 to 50,000. The indirect fatality by violence, disease, poverty, &c., arising from the intemperance of others probably doubles the mortality of the personally intemperate. Some give far higher estimates than these. Moreover, during epidemics of contagious diseases the intemperate and drunkards are the first to succumb and die. While

in all diseases their chances of recovery are largely diminished.

That the question of alcoholism is daily becoming more important because of the increasing consumption of wine, spirits, liquors, and fermented beverage; and their increasing adulteration, especially with pernicious chemicals, meant to give them strength, colour, or flavour; is shewn by the testimony of Laborde, a French authority, who says that it may be estimated that the maladies due to alcoholic drinks constitute one-fourth at least of the diseases observed in France.

The statistics of the diseases and mortalities of different trades viewed from the standpoint of their facilities and temptations to over-indulgence. "Nipping" or "pegging" is very deleterious, and is indeed the worst of all kinds of drinking; worse than taking liquor while eating; and far more injurious to internal organs than occasional outbursts of drunkenness followed by intervals of strict sobriety. Its main effects are shewn on the liver, in which it may induce hepatitis, chronic enlargement, or cirrhosis; and on the kidneys, in which it may induce granular kidney or Bright's disease. The following table shews the marked contrast in the death-rate of "nippers" and non-nippers; from diseases of the organs most apt to be affected by alcohol.

TABLE VII

Death-rate of Men between Ages 25 and 65 (Harley-Lancet, Mar. 3, 1888).

Trades.	Diseases of			
	Liver.	Urinary.	Nerv. Syst.	Circul. Syst.
1. Men exposed from their avocations to the temptation of nipping:				
Commercial Travellers	61	44	139	100
Brewers	96	55	144	165
Innkeepers, Publicans, Vintners, Barmen, Waiters	240	83	200	146
2. Other industries not exposed to the temptation of nipping:				
Gardeners and Nurserymen	18	39	63	82
Printers	28	30	90	93
Farmers and Graziers	41	31	81	
Drapers and Warehousemen	35	37	109	75

Thus in every case the deaths from disease of the liver,

kidneys, nervous, and circulatory systems is very much larger among those exposed to drink temptation, and who therefore, as a rule, drink more than in some other industries.

Again, the next table (8) will shew from the Registrar-General's returns the appalling comparative mortality from liver diseases in different industries between the ages of 25 and 65 (years 1880-1-2).

TABLE VIII

Mortality in different Industries.

Bookbinders	3
Booksellers	4
Hatters	9
Tobacconists	10
Druggists	18
Printers	18
Gardeners	19
Miners	19
Butchers	21
Fishermen	22
Brewers	42
Innkeepers, Publicans, Vintners, Waiters, Barmen. ...	197

This table proves that the number of deaths among publicans and those most exposed to the temptation of excessive drinking is 66 times greater than among the first-class, bookbinders. In other words, for one death among the latter there are 66 among the former. Again, the following Prussian statistics tell the same tale:—

TABLE IX

Probable Duration of Life of Men.

Age.	In the Liquor Trade.	Not in the Liquor Trade.
25	26·23	32·08
35	20·01	25·92
45	15·19	19·92
55	11·16	14·45
65	8·04	9·72

These figures shew how much more likely to be longer lived are men not so tempted to drink, and therefore presumably more abstemious than men who are more tempted to exceed and perhaps especially addicted to pernicious "nipping." And the many facts already adduced prove how exceedingly unwise from the standpoint of life and health is the excessive and particularly the continued abuse of alcohol and alcoholic beverages.

But still the important question remains. Is the habitual use of beer, wine, spirits, or any other form of alcoholic liquor in what are termed *moderate* quantities, *i.e.*, when not carried to the verge of intoxication, either necessary or healthy for mankind, savage or civilized, educated or uneducated? Although unquestionably pleasant to the palate and agreeably stimulating to the spirits, are they judicious, even in small quantities, or the reverse? And, if the former, what is the amount compatible with wisdom and health? And again, distinguishing clearly between a moderate, healthy stimulant and tonic dose, and one which is excessive, morbific, narcotic, or paralyzing, an important double question is: where is the line of demarkation between these; and what quantity may be deemed safe and moderate for the individual? The question is so important that it is well to consider it at the risk of repetition of facts and arguments.

Parkes, an eminent sanitary authority, gives from 1 to $1\frac{1}{2}$ fluid ounces of absolute alcohol as the amount entirely disposed of in the body; and therefore the utmost daily limit which a healthy man may safely use without actual or apparent detriment. The equivalent of this is ten ounces of claret, hock, or other mild wines with 10 per cent. of alcohol; or 20 ounces of beer, and with 5 per cent. of alcohol. If those limits are increased by one-half the limit of moderation is reached. At the same time, just as with food, the salutary quantity no doubt varies according to the size of the body, the age, sex, industrial peculiarities and idiosyncrasies: so that many do not require so much as this. Women should clearly take less. So also, by almost universal consent, alcoholic liquids in any shape are deemed injurious to children; and the very small quantity that intoxicates them shews that they not only absorb it rapidly, but also tolerate it badly.

When larger quantities than those above mentioned are taken, they are decidedly injurious to health; and are no longer physiological, but pathological agents. But even the average quantities may prove unsanitary unless taken with certain precautions. And *excess* may be defined as threefold in character, namely:—

1st. In *quantity*. The amount each person requires de-

pends largely on personal constitution. No two people are physically or physiologically, and therefore hygienically alike. And, as in many other matters, dietic and otherwise, the quantity of alcohol or spirituous beverages necessary or judicious for each, can only be divined and estimated by individual experience or medical judgment.

2nd. In *time*. Spirituous liquors are best taken, not when the stomach is empty but with meals, especially dinner; never in the forenoon, and particularly in the morning. To take them at all times and irregularly is wrong.

3rd. In quality. As a rule strong and pure distilled liquors are comparatively noxious; and fermented ones with from 4 to 10 per cent. of alcohol comparatively harmless. Therefore, when the former are taken they should be well diluted. Because, when not, they are apt to injure the delicate lining of the stomach; and by entering the blood concentrated, to act as a potent brain, nerve, and general tissue poison. The digestible fermented liquors are usually the best for ordinary use. For example, a glass of beer or ale; one or two glasses of light white or red wine; or a smaller quantity of the more alcoholic port, sherry, or other strong wine. These are decidedly tonic, anti-scorbutic, often help digestion, and thereby aid health in some constitutions or conditions.

But, although it cannot be distinctly proved that the above-mentioned quantities are hurtful to adults generally, another question arises. Is the use of alcohol or spirituous beverages, even to this moderate extent, necessary or desirable for the majority of people? In other words, whether is *temperance* and *moderation* in their use, or *total abstinence*, the wiser course to pursue, from a hygienic point of view? Whether are we healthier, happier, more vigorous in body and brain, or longer lived, with or without alcoholic beverages. Are we or are we not benefited by them physically, mentally, morally, and spiritually? Confining ourselves to the physiological and its branches, the pathological and hygienic aspects of the question, let us now enquire whether, if they are distinctly hurtful in larger quantities, as above indicated, is not this moderate amount now spoken of perhaps injurious in a minor degree? Is there no subtle harm done to the system that casual observation has hitherto failed to detect? Is there no gradual and imperceptible deterioration of the organism; and an over-taxation of the bodily energies from persistent, though perchance slight, stimulation?

These are important questions. For if answered in the affirmative, it would clearly be wise to abstain entirely from alcoholic beverages, however enticing, as we would from any other cumulative poison or hurtful agent, mental, moral, social, or spiritual. This, indeed, forms the great and fundamental question regarding which great authorities have ranged themselves on either side, for and against. And this mainly because the problem, based chiefly on the physiological action of alcohol on the body, is a very difficult one to solve, owing to the complexity of the many-tissued, many-organed body, and the almost inappreciable occult and subtle action of small quantities of the agent in question to Man's comparatively gross senses and faculties. So that, though long observation and careful experiment have been lavished on this subject, there is still much discrepancy and wide difference of opinion. And our knowledge of the more subtle and finer action of alcohol on the system is yet in its infancy; and not yet so perfect as to enable us to definitely settle the question on this basis alone. And in most cases personal experience, based on intelligence and knowledge, must be the final judge in individual cases. However, we may reasonably infer that in most cases where there is full health, good digestion, and a sufficient transfer of nutritive material from the food to the blood, and no need exists for saving the fuel of the system; there is no special occasion for the aid of spirituous liquors, which would only over-promote assimilation, make too much blood, and thereby become disease-inducing. And we may conclude, that when taken at all it is hurtful in perfectly healthy and sound states of the system; though more slowly, insidiously, and to a less extent than when consumed in larger and more concentrated forms. And also that the detriment is probably cumulative, and therefore doubtless great and dangerous in the course of years. Would it not, therefore, be more judicious to prevent this result by avoiding its cause; than to indulge for mere gratification of the palate, and subsequently suffer the almost inevitable and often irremediable penalty?

The abstruse question, largely medical, so difficult to solve by direct evidence, is perhaps best determined indirectly. The statistics already given fully prove that intemperance causes a vast loss of health and life. While they further indicate the great advantage which total abstainers have over the intemperate, and even over moderate drinkers, that is over people of temperate habits, in the maintenance of life and health. Moreover, both scientific observation and popular experience demonstrate that under the most common as under the most important and unusual conditions to which the human frame may be exposed, the use of and especially the abnormal indulgence in,

that is the abuse of intoxicating alcoholic beverages, is decidedly hurtful. And there are certain other physiological facts that must be remembered regarding the use of alcoholic beverages, especially as they oppose and controvert certain popular delusions, and are often advanced in favour of and to countenance their full and free and widespread use.

1. We know that they are not true and permanent preservatives against cold and wet, such as those of winter in temperate regions, the Arctic and Antarctic.
2. They do not lessen, but rather aggravate the bodily heat; and too much both in summer seasons and tropical countries.
3. They are hurtful during hard work or severe exercise like that of working men; and lessen the power of sustained exertion; fatigue being better borne without them.
4. They are also hurtful during mental labour, and are not brain food.
5. They are injurious while food is deficient.
6. They are deleterious during seasons of great exposure and exertion.
7. There is good reason to believe that they do not help the body to resist disease, malarious, contagious, or otherwise, such as cholera, yellow fever, dysentery, ague, &c.
8. They do not impart permanent strength to the body, though they may slightly stimulate it for a time.
9. Even in moderation they do not improve but impair hope and cheerfulness, increase crime, and injure discipline.
10. They are a fertile cause of care, poverty, and other evils, social, and moral.
11. On the other hand, poverty and care may be the cause of the use and abuse of spirituous liquors and beverages. If the well-fed man craves for drink, it is as a luxury, which might be conquered. If the underfed labourer flies to these it is the result of an inexorable craving and law of necessity. He must work to obtain bread: but deficient food means lessened working capacity and power. The alcohol whose aid he calls in stimulates his nerves, muscles, and entire frame to supply this; though only for a time, and so it has to be repeated. The frequent repetition leads to danger.

To sum up conclusions, therefore, although it cannot be distinctly proved with mathematical or algebraic precision that the moderate use of spirituous liquors and beverages is hurtful, and their use therefore altogether and deeply to be condemned, their dietetic value is doubtless greatly over-rated. And this

is one of the medico-professional loopholes through which many an individual adds his name to the list of sanctioned and justified moderate drinkers. Although the combined gustatory and exhilarating pleasure of their use is the main reason with the majority of people. As an article of diet they are certainly not necessary for all; although they doubtless are for some. Unquestionably most people are decidedly better in health, strength, and spirits without alcohol in any form, even in what is termed moderation. The healthy human organism in ordinary circumstances and with sufficient food should and does perform all its functions without the need of any special combustion like this for the development of that vital force. Why, therefore, should not these, of their own accord, and without pledging themselves to abstinence, as a rule avoid what is doubtless if not strictly or surely hurtful at least suspiciously so, or at least not strictly beneficial; and indulge only when health absolutely requires it? But, on the other hand, while it is the experience of some that they are both happier and healthier by avoiding spirituous liquors in every shape; it is the equally certain testimony of others, including unbiassed medical men, that in small quantities they act physiologically and are healthy; that in small quantity and slightly diluted with water, they are temporarily stimulating, and promote the functional activity of the stomach, heart, and brain; thereby aiding digestion and the body generally. Therefore at times and to some they are decidedly necessary and salutary.

Both opinions are doubtless right; and the different results on different people arise mainly from personal variations in the physical constitution, habits, and mental constitution. There are people, of weak stomach or infirm frame, who are not quite ill but yet not altogether well; but just, so to speak, on the verge of disease, who find themselves bettered by a moderate use of light wine, beer, cider, or some other mildly alcoholic beverage; which apparently becomes both of dietetic and medicinal value. Then, small quantities of alcohol slightly diluted with water, promote healthy function. And, if often repeated, it becomes assimilated, re-arranged, undergoes combustion in the tissues, giving them warmth, supplying vital force, while fat is often gained. It has been calculated that $3\frac{1}{2}$ fluid ounces of alcohol will supply from $\frac{1}{4}$ to $\frac{1}{2}$ of the whole warmth needed by the body for 24 hours. And possibly whenever alcoholic liquors prove beneficial, it is mainly or always when the system generally, or some organ or part of it, requires a permanent or occasional stimulus of this kind. Are not these perfectly justified from every point of view, in acting on St. Paul's advice, "Drink no longer water, but use a little wine for thy stomach's sake and thine oft infirmities" (1 Tim. v. 13). The

same condition may also occur temporarily, even in otherwise healthy people; and warrants the occasional use of some spirituous stimulating beverage.

It has been long known that certain foods and medicines shew very different effects when given in large or in small doses; the former being often poisonous and the latter salutary. Thus far, research seems to shew that in moderate doses alcohol is beneficial, nutrimental, and though not a true food like it is stimulant of the system. And also that, while large doses are mainly rejected by the tissues, smaller ones are in a sense assimilated, entirely consumed, oxydised, converted into carbonic acid and water, being thus in a wide sense a species of food, as it supplies the system with warmth and vital force, thus sparing the reserve fat, although failing to build up the tissues. By it the heart's action and general blood current are gently and healthily accelerated; the heart is lifted up (Prov. xxxi. 6; Ps. civ. 15; Esth. i. 10); while the brain and nervous system work better. This shews how its general and local effects are often healthy and beneficial in certain states of the system, as in promoting digestion when the stomach is weak; in temporarily suspending the fixed attention and thought, as in brain exhaustion; and in producing sleep in similar cases.

Humanity may be divided into two classes regarding the alcohol question; those who can and do exercise self-control and those who do or can not. For those unfortunates who are dipsomaniacally addicted to the excessive use of intoxicating liquors, in one shape or another, the only safety and chance of cure is to leave them off at once and completely. In their case a pledge is the only safeguard. There is no satisfactory intermediate course. Whereas not only public opinion but also Bible teaching approve of total abstinence followed for example's sake, and to hold out a helping hand to the weak and errant class here alluded to (Rom. xiv. 21; 1 Cor. viii. 13). For others not so addicted it appears on the whole to be left very much to our individual discretion, and medical advice if necessary, to decide whether or not alcoholic beverages, or alcohol in one or other of its many forms, are individually necessary. In this, as in other hygienic matters, common sense and conscience must both be exercised. And the question already propounded may be answered very much as St. Paul did regarding marriage. If necessary for health we may indulge in moderation; but if not strictly needful, and especially if bad effects follow, it is clearly better and wiser to abstain (1 Cor.)

After this review of the alcohol question for human kind we are therefore fully justified in formulating the following secular medical axioms regarding alcoholic beverages.

a As, to some persons of peculiar idiosyncrasy, certain

foods, *e.g.*, milk, pork, eggs, &c., act detrimentally and ban them as food; so others cannot take certain medicines, *e.g.*, opium, quinine, &c. So also in like manner alcohol and alcoholic beverages act as poisons. Even a little in some will produce lassitude, aching, headache, insomnia, and other distressing symptoms; because they have an intolerance; often hereditary. Others they excite, rouse, or cause uncontrollable cravings or a mania for more. Neither class can or should take them in the smallest quantity. Their only safeguard is clearly in total abstinence. And the public attitude towards them should be one of charity and leniency for their innate weakness.

b Again, where alcoholic beverages cause no apparent immediate detriment, even in large doses; but yet their ultimate effects, though slow, may be serious and permanent, especially when these take the form of marked obesity; clearly no medical man would advocate their continuance.

c The majority of people, even drunkards themselves, and all medical men deprecate the excessive indulgence in alcohol and alcoholic beverages; no matter whether this indulgence is occasional, frequent, and, worst of all, constant. Because no one, even the strongest, can take much and often repeat it, without permanent bodily injury; and possibly many other secondary consequences.

d The alcohol question is one not only of health, life, and happiness for the individual: but likewise has its spiritual, moral, social, civil, family, communal, national, and even racial bearings. So also, if necessary, the question of enforcing total abstinence in individual cases, is one that may sometimes have to be considered by the state or community.

e In other individuals, where alcoholic beverages slowly induce disease, *e.g.*, gout, rheumatism, &c., especially in predisposed persons, these should be clearly avoided, just as for a similar reason sugar and saccharine foods and drinks should be avoided by some; meats, spices, &c., by others.

f Where alcoholic beverages injure, impede, or upset digestion or some other bodily function or organ, such as the liver or brain, they should be avoided.

g For persons, and they are perhaps the great majority of mankind, who eat, digest, sleep, feel, and work well; especially the young, strong, and healthy; people who feel neither the desire for nor want of alcohol or

alcoholic beverages, these are decidedly happier, healthier, and better without them, and do more bodily and mental labour, and should not therefore indulge. They need neither tonic, stimulant, nor narcotic; neither the small amount for the former nor the larger quantity for the latter is necessary. Clearly, therefore, it is better for them not to indulge save under exceptional circumstances. To such individuals alcoholic beverages if not distinctly useful they are as distinctly undesirable, and they are justified for the sake both of body and mind in avoiding them.

h But no valid reason can be adduced why alcoholic beverages should not be indulged in wherever they are not personally detrimental. For though alcohol is not a true food, it is a decided stimulant, a luxury, and one of those gifts of God that should be received with thanksgiving (1 Tim. iv. 3-5): a gift which is and has always been universally accepted by all nations. Physiologically, morally, socially, its use thus seems beneficial and lawful to cheer and strengthen the nerves and circulation, and give gentle, mental, and bodily stimulation even when the being is in health, and thus minister mildly to our salubrity and happiness: it being always borne in mind that if persistently wrongly used it may, like many other indulgences, cause, both directly and indirectly, a vast amount of the most severe and irremediable disease, and indirect, moral, social, and spiritual disasters.

i Though it is obviously wise, nay, imperative, for some persons to abstain from alcohol in any form, why should its use be forbidden or decried for others whom it really benefits even in a very minor degree, at least when taken in moderation. There are persons, and these the strong and active, who experience no obvious injury from indulgence, and who accordingly think there can be no harm in a time-honoured and pleasant custom, that of partaking this which is only one of Nature's manifold gifts, in moderation, as a luxury, agreeable and likely to make the drinker pleasant to others. Some will even all their lives drink a moderate and even considerable quantity of alcohol and be apparently none the worse. These may live long and die of ailments altogether unconnected with alcohol. This high or low capacity for alcoholic consumption depends not only on individual idiosyncrasy, but also on the circumstances in which people are placed, and their habits of life.

k For either mental or bodily "spurt" work, meant to call up the reserve store of energy which the human body possesses, a little is perhaps allowable, provided the taker exercises supreme self-control and restraint to avoid immediate excess, and also the possible growing danger of habit; matters which vary with individuals. This indulgence may often enable a person to accomplish a task impossible without it.

l Alcohol and alcoholic beverages being *per se*, that is judged according to the amount of spirit they contain, inadmissible into the list of foods, what do experience and philosophy say should be our attitude towards these as a luxury and as pleasing drinks? As regards this it should not be forgotten that the more delightful the drink and its effects are, so much the greater is the temptation to excessive indulgence. It is the milder use of alcohol and alcoholic beverages which is now mainly disputed; some authorities alleging that natives who use them compare favourably with others who do not; accomplish greater deeds, mental and physical; shew a smaller mortality, and have less disease. The entire question is clearly an intricate and difficult one; and high authorities are arrayed on either side, for and against, even its limited employment: although unquestionably the great majority of medical men favour its moderate use. It is a question that includes important issues; and involves physiological, moral, social, and religious problems requiring deep study, and are not very easy to solve. The balance of health is so nicely arranged that, as a rule, a little alcohol does most people no harm. And it will be easily understood why the question is, How should each person judge and decide for himself? But, as before, the following axiomatic ideas may be safely laid down on this branch of the alcohol question.

m The healthy person who wishes to retain health and live long ought to habitually abstain from alcohol. But when from prudential health motives he does indulge, he should do so moderately and wisely; and only when his bodily vigour or spirits, or both, are not exactly ailing, but yet decidedly below par and require a slight stimulus. This condition is scarcely a state of health; but one which is on the borderland of and yet not exactly decided disease: a condition which, generally speaking, includes those varied conditions which are accompanied by weak, failing, or sluggish circulation.

n Common observation, both medical and lay, proves that the moderate consumption of alcohol and alcoholic beverages is useful to many persons in health. Who therefore are those individuals who may thus safely and judiciously use them?

o A certain percentage, perhaps the majority of adults in health, can take a moderate quantity of alcohol in some form or another, not only with impunity but with apparent advantage and positive benefit of some kind or other, and if they leave off for a time symptoms arise which indicate that the nutrition of the system is not fully kept up, necessitating a return to the usual alcoholic aid. It not only gratifies the taste, but also cheers, stimulates, and gives them pleasure. It has not been positively proved advantageous to those in good or average health, regarded either as a food aid or as a medicine. Still, some cannot do without a small amount of stimulus. It is a necessity which enables them to exert the full measure of their powers. It develops their latent energy. Why should not these take it? Should those to whom alcohol disagrees deny it or deny its use to those who benefit by it. This is an individual and a social and not purely a medical question. In these cases judicious moderate doses of beer, wine, or even stronger stimulants, taken with meals, has two benefits:—

1st. It not only does the stomach locally and the frame generally no mischief, but

2nd It positively benefits both digestion and the health and vigour of the entire body. So that these persons are better of it, and not so well without it. Nor should the terrible consequences of intemperance frighten or deter these persons from the good results of true temperance, that is *moderation*, and drive them into unwise total abstinence. Unwise if it leads to deteriorated health and even disease. It is clearly as culpable to do so as it would be to avoid food because gluttony and over-indulgence induces dyspepsia and worse diseases. Assuredly, alcoholic drinks have both their proper and improper employment in our ordinary dietaries. But their effects on man are not altogether and always mischievous.

p In not a few cases the wise employment of alcohol and alcoholic beverages does good. For example, where

the health is below par, and the body on the borderland of disease, digestion and other important functions are weak and flag: and where these in moderation give a philip and a restorative to the exhausted or wasted system in its debilitated states. In such cases their judicious employment is wise. The lack of necessity for total abstinence being settled in any individual case, and the contrary, need, and wisdom of taking alcohol in some shape or other established; another vital question arises, what is meant by temperance, and what by over-indulgence? Where does the former end, and the latter begin? Can any general rule be laid down applicable to all persons? Can any law be made even for individual cases? Unquestionably no hard and fast law of the former class can be laid down; and none even for the latter; because no two people or cases are alike. Even the same individual may require different treatment at different times. So that what may be temperance for one may be over-indulgence for another. And what may be temperance at one period may be excess under other circumstances in the same person. Indeed it is with this as with most things in life, as for example the kind, amount, and quality of the food we eat or of fluids we drink, even water; the amount of exercise, sleep, amusement, we indulge in; and even the medicine we must sometimes take; these, like alcoholic beverages, have to be regulated and apportioned according to constantly varying individual requirements; and every individual must judge for himself in this as in other things. The great difficulty in the matter is to judge correctly and dispassionately.

q A natural question here arises, are alcoholic beverages or alcohol good, bad, or indifferent to the perfectly healthy frame? Are they a necessary or wise adjunct to the ordinary diet? Are they to be classed among the necessaries of life or only among its luxuries? And if the latter, are they judicious or morbific? Can our feelings and sensations; those felt ere we indulge guide us in the matter? Why should they not do so if we guide them with a healthy judgment, especially as to proper amount and time?

r What the unprofessional public want mainly to know in the matter from the better informed medical profession, whose study it is, amounts to this, how far the moderate use of alcohol and alcoholic beverages may and ought to be indulged in at the present day with-

out producing local or general bodily evil: remembering always the daily increasing rate at which we live, the consequent strain on the nervous system, the wear and tear of modern life, and the artificial circumstances under which we exist.

s When indulged in therefore they should clearly be taken wisely and in *moderation*. What moderation means and is each person must find out for himself and for his own case, no two people being alike; so that we cannot decide for one another.

t While everyone condemns the use of alcohol, as health-ruining, disease-inducing, life-shortening, character-destroying, moral-depraving, and family-impoverishing; what is the truth and the wisdom regarding its use and abuse? Is it not only of no service but positively injurious, and therefore to be strictly avoided, even in the smallest quantities. Or, as often happens in other things, does the truth lie on this point, between the two extremes of total abstinence and unlimited indulgence? Does their moderate use not only do no harm, but even positive good; thus constituting this the true safeguard, and making its use decidedly advisable under certain circumstances. There is a natural, healthy, and therefore safe inherited taste in most adults, implanted for good and not for evil, which becomes a natural and therefore wise guide for our personal daily practice. Like all other desires and instincts this should be indulged when distinctly present. And it is unquestionably wiser to indulge in this judiciously than to neglect. The judicious use of alcoholic beverages evidently therefore corresponds with the judicious use of bread, cheese, and other ordinary foods and luxuries. The natural and implanted taste for alcohol and alcoholic beverages in moderation is a wise one. Just as the entire animal world, man included, have other natural desires, greater and smaller, *e.g.*, water for drink, salt as a condiment, &c., so they often also have for a gentle stimulus like this.

u There is not yet satisfactory evidence to make it certain or even probable that a moderate habitual use of any kind of alcoholic drink is generally or even occasionally injurious to some. On the other hand, there is sufficient reason for believing that such an habitual use is on the whole generally beneficial. As yet we have no trustworthy statistics to shew that abstinence from the moderate use of alcohol is attended with unusual

improvement in health and in length of life. Granting the pleasure its use in one form or another often gives, we still want satisfactory physiological facts to prove the benefit of the moderate use of alcohol over total abstinence, and especially over excess.

v The discipline of moderation is as good, and even better than that of total abstinence; since the need for restraint under temptation is greater.

w Moderate use when grown into a custom is pleasant, and doubtless useful discipline.

x Is it not unreasonable to require the majority of the human race to cease from what is lawful, permissible, healthy, and pleasant; viz., the moderate use of alcohol or its beverages; merely in order that the few may be induced to cease from what to them is unlawful because deeply mischievous.

y What is moderation differs in different persons, ages, climates, occupations, &c. Each should and indeed must therefore settle the matter of quantity largely and mainly for himself or herself. Different people require not only different quantities but also different kinds or combinations.

z In moderation the use of alcohol or alcoholic beverages of some kind may often be admissible for persons past middle age who may not previously have indulged; but whose strength is now declining. Or by those debilitated by advancing age, unfavourable external circumstances and environments. Also during convalescence from prostrating diseases. And it is in these that, properly used, their beneficial action is most seen, and seen to be most valuable remedially, as will be noticed further on.

aa Some nations and races, *e.g.*, Mahometans, whose faith precludes them from alcohol and alcoholic beverages, get on without them. But with these their place is often taken by other stronger, more deleterious, and worse varieties of stimulants and narcotics, *e.g.*, opium, Indian hemp, &c. Thus this foreign custom is clearly no argument against the moderate use of alcohol and alcoholic beverages among those whose faith like ours does not forbid.

bb Properly used alcohol in one form or another has been abundantly proved to be a rational and very potent source of comfort and even strength to many. And the questions of "proper use" and "moderation," which are in this instance practically identical; and that of quantity are perhaps best answered by its effects. If

they excite too much or stupefy or paralyze, the amount taken to effect this is clearly not moderation, and is unsafe. On the contrary, if it comforts, calms, and balances it is safe.

cc As to the precise quantity we take and the kind we choose, the experience which is personal is the best; and gives precise knowledge, which is better than secondary advice, even if this is professional. No definite standard quantity can be laid down or acted on as the effect even of very moderate quantities differs not only in different persons, but even in the same person at different times and in different circumstances. If a definite quantity might be stated as a safe one in 24 hours, this might be as much alcohol as is contained in half a bottle of good claret; that is less than a fluid ounce of alcohol (Parkes; Garrod).

dd Strong malt liquors undiluted are obnoxious. But when taken should be drunk only if freely diluted with plain or medicated water; especially alkaline varieties. Light wines and still milder malt liquors, such as cider, perry, &c., contain sufficient water, and their spirit is already sufficiently diluted. If alcohol is taken pure or strong it may irritate and inflame the mucous membrane of the stomach; and therefore the percentage should be small in beverages, *e.g.*, as in light French and German wines: and even these are better diluted, dilution being important.

ee The real secret as to quantity is in this as with many other things. What will suit one person will not suit all. All persons are not alike. No two have identical constitutions; and we all materially differ, not only anatomically and physically, but also physiologically. Again, following the same vein of thought, the effects of alcohol differ materially in different classes of people. Each case therefore demands a treatment of quantity and kind suitable to itself. And in deciding whether or not any given individual should indulge or should wisely refrain, and the amount of frequency to which this should be carried safely, we must take into account various things, especially individual idiosyncrasy, age, sex, climate, habits, occupation, station, &c.

ff For these reasons it is admittedly difficult to determine the exact quantity for each individual; or to apportion a definite standard for all: so as to avoid the small excess which is sure to ultimately do harm to the health and the body, especially if oft repeated, and persisted in.

gg But we should never forget; and all should know; and the fact deserves repetition to ensure enforcement; it is *moderate* alcoholism which alone is the true law when alcohol or alcoholic beverages are taken: and the amount is a matter of upright personal experience and conscientious restraint in individual cases. Man should be *moderate*, that is *temperate*, in this as in all other things. Whereas excess or intemperance in drink is only one of many forms of transgression; even in non-alcoholic fluids. Moreover, for example's sake, strict, wise, and moderate temperance of this nature is often better and more influential than total abstinence.

hh The amount of alcohol which is justifiable or wise varies with several different circumstances, thus:—

1st With individuals. What would be temperance with one man would be intemperance with another. Some require and can take more alcohol than others, even as they perchance require more food, sleep, exercise, &c.

2nd The depressing influences of town life often increase the necessity for augmenting the usual quantity of alcohol.

3rd Weather, climate, cold, winter, summer, the amount of work or worry, &c., are other frequent and important factors in causing variations which should be followed. A man of observation and temperate in all other things is apt to be so in this, and is a better judge of what quantity he needs; what kind agrees best with him, when to indulge, and other collateral circumstances, than anyone else.

ii But, while every individual should judge for himself whether he requires alcohol or not and the amount judicious for his particular case, it is unwise in any one to seek it at all, certainly not much, and above all not for long, and as a continuance; even to court relief under unusual anxiety, care, or sorrow. Nor is it wise for the mentally over-worked student, statesman, &c., to do so.

jj Certain rules should therefore be remembered even by those who from choice or necessity, take alcohol or alcoholic beverages in moderation. They should never be taken on an empty stomach, but always with food or after meals. It is when taken without food that they do most harm, especially the stronger kinds. Because then it is quickly absorbed into the blood, and its local effect in the stomach and its secretion, and on the

general frame are the most powerful. And it is when taken with food that its benefits are greatest, and the danger of falling into habitual excess is least. The practice of "nipping" is highly pernicious, especially in the early morning when the stomach is empty, or before the mid-day meal; and to many it is best avoided before the late dinner also.

kk The stronger forms of alcohol, and the stronger wines, beers, &c., are apt to contain certain matters from which the lighter fluids are free; thus often making the former more and the latter less dyspeptic.

ll One of the great dangers and difficulties in regulating the matter of quantity lies in the varying alcoholic strength of different kinds of spirits, wines, beers, &c. It is well both for the medical profession and the laity to be aware of certain facts regarding the composition and especially about the hurtful impurities of different forms of alcohol and alcoholic beverages, so as to enable us to discriminate wisely in selecting for different individuals or for ourselves. Thus, among the distilled spirits, brandy contains enanthic ether, which sometimes acts beneficially on the stomach. Whisky may contain fusel oil (amylic alcohol), which is detrimental and causes headache. Gin contains juniper oil, which acts on the kidneys as a stimulant. Rum is apt to affect the liver. Moreover, "silent spirit" or nude alcohol, artificially flavoured, coloured, and doctored to produce cheap forms of all of these, whisky, brandy, gin, and rum, is now often sold for the pure and real article; the false kinds being made up of silent spirit, water, chemical flavours, and colouring, sweetening, and bouquet. So also light wines with no sugar, alcohol below 12 per cent., rich in tart. potas (cream of tartar), sit easier on the stomach, and are more easily eliminated than stronger wines. Again, we have the stronger wines containing sugar and alcohol up to 12 per cent., often plus added spirit and a little cream of tartar. There is something in these partially fermented wines which may cause dyspepsia, and ultimately gout. Again, malt liquors, ale, porter, beer, stout, &c., contain alcohol more diluted than in light wines; but combined with sugar, gum, extractives from malt and hops. These are often stomachic and nutritive, but apt to disturb the stomach and the process of digestion, as well as the liver, unless under much physical exercise. Moreover, the discontinuance of these is often more felt than with spirits or wines.

And after middle age few sedentary persons can indulge in them with comfort. Hence at the present day not only spirits of all kinds, but also wines, and even beers and other malt beverages are often impure and therefore bad, both for health and longevity. Strong fortified wines are really alcohol diluted with wine; and not the honest and innocuous wines drunk in grape-growing countries. Purity should be enforced.

mm Where alcohol or alcoholic beverages have been long indulged in, even in moderation; their discontinuance is apt to cause not only discomfort but even disease, or symptoms on the borderland of this, viz., chilliness, heaviness, neuralgia, boils, failing health, &c. Should this happen, why should they not be recommenced, under ordinary circumstances.

nn On the other hand, whenever their use, either by moderate or immoderate consumers, is found to be detrimental, even in the slightest degree, of course it is wise to leave them off; a rule applicable even to those who have long indulged.

oo Many persons accustomed to alcohol and alcoholic beverages, mainly from social custom and example, but able to exercise self-control, can and should leave them off not only with impunity but with advantage to health; and thus enlist in the class of those by whom they are not required.

pp Clearly, therefore, as we use alcohol and alcoholic beverages, we make them agents either for good or for evil.

qq Clearly also medical science can only give general advice; and cannot yet, perhaps never will be able to, lay down hard and fast rules as to the individual use of alcohol and alcoholic liquids.

rr All medical men condemn the occasional, still more the frequent, and above all the continued excessive use of alcohol and alcoholic beverages. They recognize this intemperance as one of the great and crying social evils of the day, which no sane person can uphold; one of the foulest of cankers in the private home and national life; an evil that at one and the same time interferes with human holiness, happiness, virtue, peace, prosperity, health, life, longevity; and has its philanthropic and its medical and social aspects, all of the widest import and interest. So high does feeling run on this subject with some that alcohol has been more spoken against than any other beverage; and has been designated the "Devil in solution." On the other hand

most medical men inculcate not *total abstinence*, save in special cases; but *moderation*: thus avoiding self-denial on the one hand, when indulgence would be injurious and unwise; and self-indulgence on the other hand where this is likely to be detrimental.

ss Alcoholic excess, both in the stronger and weaker beverages is unquestionably one of the chief causes of human misery and disease. But this fact cannot be fully accepted as a reason for discarding it entirely and not even taking it in moderation or even medicinally: than for giving up opium, tobacco, and many other things, which also have their victims from their abuse and their penalties.

tt The bad effects of much alcohol in any shape are proved beyond dispute; and shew themselves in every rank and race. Few will have the temerity to deny this, or excuse the personal folly which produces it among ourselves, or spreads it among others, especially semi-civilized or savage races.

uu Certain persons shew an exceptional and idiosyncratic intolerance regarding alcohol and alcoholic beverages, as they do towards other articles of diet, drink, or medicine. Thus some are intolerant of tea, coffee, tobacco, eggs, milk, shell-fish, &c., so also alcoholic beverages sometimes cause discomfort and should obviously be avoided.

vv As will be readily understood, purity is as important a factor in the question, selection, and use of alcohol and alcoholic beverages, as it is regarding food, medicines, and all that enters intimately into or passes through the human body. None but the purest and the best should be drunk, of all and every kind, strong or weak. None but this should be offered or permitted for sale.

ww Children, infants, and young persons should not have alcohol or alcoholic beverages, especially if delicate. To these they are a slow poison; and the idiosyncrasy against them is as strong as it is against opium, especially in infancy. In healthy children during growth, when nutrition is most active, there is little or no need for alcohol or alcoholic beverages: and they should be avoided except by medical advice, and under exceptional circumstances; as their use at that histologically impressionable and undeveloped period may check growth and cause general stunting.

xx When anyone has arrived safely and healthily at adult age without having taken alcohol or alcoholic beverages, the same abstinence may usually be continued

with advantage to comfort, happiness, health, and life.

yy Those persons who, from conscientious motives exercise personal self-control by going beyond temperance, and altogether forego this luxury by becoming total abstainers for example's sake, in the effort to reclaim their erring fellow creatures, and helping such as are weak in moral principle and apt to exceed, lest they by example make their fellow creatures, easily led astray, to offend, are surely worthy of the highest commendation.

zz When spirituous liquors, wines, beers, &c., of any kind are taken in strict accordance with these maxims, precautions, and rules, they will certainly do no harm to the health or the tissues and functions of the human frame: and may, on the other hand, do a certain amount of good, in addition to the gustatory gratification they usually afford.

The consensus of opinion, both medical and lay, is, that the processes of alcoholic and vinous fermentation in the economy of nature was and is no more a mistake and a curse than was the acetic or the butyric. On the contrary, like these it is a blessing, and humankind owes much to each and all. It was no more so than was the elaboration of so many poisons by the vegetable and the animal kingdoms; many of which we usefully and beneficially employ in *moderation*, as we should alcohol; although they are hurtful in excess. As well say we should abstain from our ordinary food because many indulge in detrimental surfeit. It is perfectly legitimate to enjoy or use any of these things in moderation, even when they cause disease or detriment in excess: and so of alcohol. To adjust the quantity of alcohol, food, and so on in conscientious accordance with our bodily requirements is part of the discipline of life; and of that mundane and Divine education which inculcates and enforces moderation in all sublunary pleasures. It is the practice of self-denial in the indulgences of life that is the main discipline of our earthly existence. And among these alcoholic beverages and other pleasures of the table and the palate are among the most seductive, and those to which we oftenest unwisely and feebly succumb. To sum the matter up, it is with this as with our "talents" and Nature's many other beneficent gifts. They are given us to judiciously *use*, enjoy, and benefit by; but neither to despise and neglect on the one hand, or to abuse on the other.

3. Alcohol and Alcoholic Beverages as Medicine

Regarding the question of the relation of these to mankind;

while their excessive use is universally denounced and condemned by all sane persons, both medical and non-professional, so as to put their employment in this degree entirely out of discussion; still, the further question as to their moderate use has to be debated and solved by the two great classes into which the human race may be divided; namely, medical men, who study the subject from a humane, philanthropic, and scientific point of view; and the more or less uninformed public who have to be enlightened by them, as they regard the matter more from social than personal points of view.

Unfortunately, medical men are also divided into two opposing camps on the question, viz., 1st, total abstainers or teetotallers, who advocate their entire avoidance: and 2nd, moderate abstainers or temperance men, who encourage their judicious and sparing use in health. But total abstainers are again subdivided into such as denounce their use, even in sickness; and those who use alcohol or alcoholic beverages for special cases of disease. On the other hand, the camp of moderate abstainers, which includes the great majority of physicians, recommend its use in disease; and regard it as a true and valuable medical agent in sickness; and therefore use it frequently in appropriate cases.

Thus even regarding alcohol and spirituous beverages as remedial medical agents, there are alternative, affirmative, and negative views regarding them; just as there are regarding their efficacy in health; in proportion to the lesser numbers who can enter into the discussion. But as the preponderance of medical opinion is in favour of their judicious use in health, it is the same as to their place and power in sickness. And these aver that there are unquestionably conditions of disease in which they are valuable remedies. Even earnest and able advocates of total abstinence admit this; just as they admit their hygienic virtues in those conditions in which the health of the body is below par and the vitality of the frame, its organs, parts, tissues, and functions are on the borderland of disease; the access of which the judicious administration of alcohol in some form may prevent.

Altogether apart from the benefit already mentioned as often derived from the judicious use of spirituous beverages, especially wine and other milder forms, in debilitated states of the whole body, or of one or other of its many different organs when not exactly in full health and yet not quite in a state of disease, but merely on the borderland of it: unquestionably the great preponderance of medical opinion tends to confirm their marked utility when employed in medicinal doses, well selected as to kind, given in smaller quantities, and sufficiently often to develop their tonic and stimulant action, and yet avoid their narcotic, anæsthetic, and paralytic effects.

Alcohol and especially wines are indeed useful medicines; and remedies we could scarcely do without. Although it is not yet scientifically, *i.e.*, physiologically known how they act on the body, their therapeutic use is no less certain. But we have still much work to do ere we can determine how this is accomplished; and the rôle which alcohol plays either in disease or in health; and how its use affects the history of individuals, nations, and the race. In medicine, however, they are like other drugs and even foods. Thus opium and other medicines, and even meat, bread, cheese, butter, milk, and so forth, are all beneficial in moderate quantities. Whereas in larger quantities they may be the reverse. And, so employed, alcohol and alcoholic beverages are often beneficial medicines in sickness, although they are neither convenient, safe, nor true foods for health. Inasmuch as, when taken in health, *i.e.*, hygienically or as a luxury, they are only safe and good when enough only is given to develope the stimulant, tonic, and occasionally their sedative action. So also, when administered medicinally we should never go beyond these effects, although the quantity necessary to produce this may be different in the sound and in the ailing frame. In both conditions, health and disease, the narcotic, anæsthetic, and paralytic results of the medicine are to be avoided. Their excessive administration in disease is as universally condemned as in sickness. As a medicine, like opium and other therapeutic agents, it is both lawful and beneficial to administer alcohol, so as to act on the body or its functions in certain of its diseased or its weak conditions, local or general; many of which it decidedly benefits when rightly used; as proved by the evidence even of total abstaining medical men. The group of diseases in which it is wise and beneficial to use it; and in which alcohol is imperative, and in which there is no substitute for it, is large. It would be out of place here, as it is unnecessary, to give a list even in epitome where alcohol in some form is often invaluable; and only a few instances can be cited now.

In some chronic diseases like struma and phthisis they often give the general system strength to battle against the local disease. Some even aver that they tend to save from tubercular disease, cancer, and infective fevers; but this lacks proof. On the other hand, in cases of heart failure, lung disease, and ailments in which these occur, they are valuable. They often control pyrexia, fever, and depress the temperature as an economic factor when the organism is, so to speak, living on itself: and then may prove useful by calling forth latent power. In convalescence from many acute diseases, infectious and otherwise, *e.g.*, the contagia, they aid the vis medicatrix to speed the parting guest and more quickly build up flesh, strength, and health

to their normal standard. They often act as sedatives of the nervous system, and are used for this purpose in diseases with delirium and exhaustion. Were it necessary many other examples might be given. But these will suffice to indicate that alcohol and alcoholic beverages are often decidedly useful in disease.

The question of their use in inebriety, either inherited or acquired, delirium tremens, dipsomania, and other diseases arising directly or indirectly from the abuse of alcohol is a medical one. Such cases require moral and mental as well as medical treatment. It is a disputed point how drunkards should be reclaimed; whether by total abstinence or by teaching and alluring them to abstain from excess and confine themselves to the practice of moderation; that is to the wiser use of their bane by the exercise of strong self-control and self-denial in the employment of that which may after all be to them almost one of the indispensable necessaries of life.

Although injurious to the young in health, alcohol and alcoholic beverages, strangers in their usual diet and regimen, are often useful to them medicinally employed in their ailments.

As to selection for different ages in disease; nutritive and stimulating wines and beers are generally better in the treatment of grave and exhausting diseases, and diseases of debility, when little nouishment can be taken; than the stronger varieties, brandy, whisky, gin, and rum.

B. Biblical Opinions Regarding Alcohol and Alcoholic Beverages

From what has already been said individual experience is clearly invaluable and paramount in deciding as to the use or the refusal of alcohol or alcoholic beverages in ordinary circumstances and as an article of diet. So is judicious medical advice to supplement this. With Christians the great and decisive question is, what does the Bible say on the subject. What are its health hints, if any, regarding alcoholic drinks? The Holy Scriptures are the great, God-given arbiter and guide of human conduct, and to these we naturally turn for enlightenment regarding this question. Especially as the precepts of the Divinity ought to finally settle any doubt or dispute. The question naturally arises, does the Bible counsel us clearly and emphatically regarding our attitude towards wine and other spirituous beverages? Do its dictates, its biographical and historic examples and its didactic teaching regarding their use in Bible times aid us as to how we in modern days ought to accept or refuse to use them; to receive them as blessings or as

a curse. The folly, nay sin, in their *excessive* use is clearly pointed out in Scripture, and in unmistakeable language. But that does not settle the question as regards their *moderate* use. Does the Bible teach that the free agent, Man, may indulge in them in an abstemious manner. Or does it forbid this and inculcate that as a rule we ought to be, at least in health, total abstainers, and regard alcohol and spirituous beverages as poisons, unhealthy, dangerous, and so wholly and at all times forbidden. That is one of the great and leading personal and social questions of the present day. Does the Bible, therefore, our human guide-book, help us to solve what is known as the alcohol question. That Book certainly does not sanction the abuse of this or of any other of the many things which God has given us. But does it sanction its use at all? And if it does, under what circumstances does it do so? We may not have the actual wines and beverages of Palestine; for each region has its own. But they all practically agree in containing spirit in greater or less quantity. So that the Scripture verdict regarding the former is applicable to our modern varieties of spirits, wines, and malt liquors. And the main questions to be decided by the Holy Scriptures regarding these are: 1st, Is total abstinence or temperance the most judicious or imperative for any or for all. 2nd, What does the Bible consider temperance? 3rd, Does the Bible and modern lay experience agree or differ on these points? The alcohol question hinges largely on the varying opinions afloat in the community at large, regarding the dietetic, hygienic, and medicinal properties and value, or the danger of alcohol, and the true action of that fluid chemical on the health, life, comfort, happiness, and welfare of man. This is really the debateable point: one admittedly very difficult of satisfactory and definite solution. Does the Bible help us to settle these points?

Both wine and strong drink are often mentioned in Scripture. The manufacture of the former is at least as old as Noah (Gen. ix. 20-21), who was probably the first to discover the process. The subject of drink is one to which everyone of the 66 writers of the Bible have alluded; doubtless because it is so alluring as to be apt to lead to an all-pervading and obnoxious vice, apt to ruin man not only physically, but also socially, morally, and spiritually, for time and for eternity. Hence no hygienic subject is oftener re-iterated and dwelt upon than this; evidently suggestively so, and for a wise purpose: namely, to point out which of the three classes into which humanity may be divided, namely, the intemperate, the temperate, or total abstainers from alcohol and alcoholic beverages, is right, and which is the wisest of the three courses to pursue.

Even this point, that the Bible solves the question for us

has been doubted and debated. Both temperate and total abstaining referees have claimed it as advocating and inculcating their views only. And this because we find that the Bible sometimes praises the use of wine and sometimes condemns it in equally forcible terms. Now how is this apparent discrepancy and seemingly conflicting advice to be explained? We naturally ask, is it the same thing which is commended here and condemned in other places, or is it something different? The matter is one, both in its physiological and moral aspects, that is of national and racial as well as of individual importance, and therefore worthy of the attention of Bible students. The cause of these different estimates of wine in the Bible is doubtless to be mainly explained by different products and beverages, both natural and artificial being translated by the one word, "wine"; although the Hebrew and Greek words so translated consisted of very different fluids, of different alcoholic strengths and different dietetic value, composition, properties, and degrees of utility or danger to health and life. By close study and correlation of widely separated scriptural allusions and hints, it will be found that the use of wines and spirituous liquors has been long since fully and plainly pointed out in Holy Writ; as have both their beneficial physiological effects and its baneful morbific ones; and also the true, wise, and universal rule and standard for their employment, namely moderation or temperance. The subject has been well examined from many different points of view. Its philology has been discussed, especially by Ritchie and Kerr; and the very important matter pointed out, namely, that the above-mentioned discrepancy as to the value and virtue of wines is only apparent, and may be explained by an ambiguity and looseness in the translation of the Hebrew and Greek words used in Scripture to denote different kinds and strengths of alcoholic drink, which was not always what we strictly understand as wine. The translators of the Holy Scriptures have somewhat loosely used the generic word *wine*, which occurs 261 times in the text, as the interpretation of no fewer than 13 different words and varieties of fluid, of which nine are Hebrew and four Greek. Every one of these denotes and implies a totally distinct liquid, that ought each to have its own special name. The text proves that different kinds of wine existed in Bible times. Thus Nehemiah (Neh. v. 18), while governor of Jerusalem, speaks of providing "all sorts" of wine for his household: clearly proving that more than one variety was then used. The different kinds of spirituous liquids and wines which are spoken of in Scripture and translated in our Bible under the name of wine are as follows:—

1. Tîrôsh, which occurs thirty-eight times in Scripture, and means either, *a*, vine fruit in its natural state of grapes,

or dried as raisins: or, *b*, new wine, this being probably the ordinary and popular name for fermented intoxicating wine. It is Tîrôsh which takes away the heart or inebriates (Hos. iv. 11; Is. xlix. 26; Joel v. 5).

2. Eshîshâh or Ashîshâh, which occurs four times in Scripture (2 Sam. xvi. 1; 1 Chron. xvi. 3; Cant. ii. 5; Hos. iii. 1), and means either flagons of wine, cakes made of grapes, or fruit cakes, *i.e.*, pressed raisins.
3. Asîs or Ahsîs; which occurs in Scripture five times, viz., in Cant. viii. 2; Is. xlix. 26; Joel i. 5, in which it gives occasion of excess; and in Joel iii. 18, where it forms part of a Divine promise, as it also does in Amos ix. 13. This refers to the juice that sometimes drops from the grape clusters as they grow; that is unfermented, freshly expressed grape juice: or new wine recently trodden but not necessarily unfermented.
4. Sôbhe or Sôveh, which occurs three times, viz., Nah. i. 10; Is. 1. 22; and Hos. iv. 18; the latter in the sense of a debauch, and in all three the term implies a liquor that would be spoiled by admixture with water. This means luscious inspissated wine or the boiled juice of the grape; strength being its character rather than sweetness.
5. Chemer, Shemar, or Khamar (foaming), which occurs eight times (*e.g.*, Deut. xxxii. 14; Ez. vi. 9; vii. 22; Dan. v. 1), and means the sweet unfermented grape juice foaming from the vat in its fresh but turbid state; or during fermentation.
6. Shĕmârîn or Shĕmârîm; which occurs four times in the sacred text, and means old and pure *wine on the lees*; that is the richest and best wine; and perhaps well refined preserves. Others translate it dregs of wine.
7. Mesech or Mesek (mingling or mixed with something else), occurs five times; thus in Ps. lxxv. viii., severe punishment; Is. lxv. 11, Prov. ix. 25, in both of which it means mingled liquor for high festivals; Prov. xxiii. 30, Is. v. 22, in both of which it means occasions of excess, the cup full mixed. This means *wine mixed* with water or myrrh, mandragora, opiates, and other strong spices or drugs to create or increase its intoxicating qualities, and either fermented or not. Wines were often drugged thus in Palestine, with spices, mainly to increase their potency (Prov. ix. 2; Cant. viii. 2). Strength was not the sole object sought. The wine mingled with myrrh given to Jesus was meant to deaden pain (Mat. xv. 23). The spiced pome-

granate wine prepared by the bride was of a mild character (Cant. viii. 2). The sweet wine of Acts ii. 13 and Cant. viii. 2 was probably the very purest juice of the grape.

8. Shechar or Theclar, which occurs twenty-three times, is a general Bible name for the sweet fermented, therefore alcoholic and intoxicating liquors made from dates, grain, and other fruits, excepts grapes and grape juice, that is true wine.

9. Yain, Yayin, or Yakin, which occurs one hundred and forty-one times, that is oftener than any other term, corresponds to the Greek oinos, and is the most frequent generic term and popular designation for all the different kinds of Biblical intoxicating wine, and occasionally fruit; and sometimes signifies, *first*, the growing grapes; *second*, the newly expressed, sweet, and unfermented juice of the grapes, otherwise called *must*, *new* wine, and pure blood of the grape (Deut. xxxii. 14), which contains no spirit, and is therefore non-intoxicating; and, *third*, every species of fermented, that is spirituous and intoxicating wine. The Biblical record of Yayin is bad; as it is strongly animadverted on. Thus it is this which, in excess, causes the dark flashing (angry?) eye (Gen. xlix. 12); the unbridled tongue (Prov. xx. 1; Is. xxviii. 7); excitement of the spirit (Prov. xxxi. 1; Is. v. 11; Zech xix. 15; xix. 17); enchained affections (Hos. iv. 11); perverted judgment (Prov. xxxi. 5; Is. xxviii. 7); causes indecent exposure (Hab. ii. 15); and heat sickness (Hos. vii. 5). All these shew the results of its intoxicating qualities.

10. Chômetz or Kômetz; fermented but not intoxicating. A weak, sour wine, ordinarily called vinegar.

11. Oinos, which occurs thirty-two times in the New Testament, and is a generic Greek term for different kinds of wine; for all kinds, fermented or not. This Greek word corresponds to the Hebrew Yayin.

12. Gleukos, or sweet wine, which is spoken of once in the New Testament, means sweet, unfermented grape-juice or *must*, drunk by the ancients in the morning. It usually exudes or is pressed from ripe fruit by its own weight in the wine-press before treading (Acts ii. 13). The first drops of juice which reached the lower vat was called the denia or "tear," and was the first fruits of the vintage to be presented to Jehovah (Ex. xxii. 29).

13. Sikera, a sweek drink, probably intoxicating. The word is a Greekisized form of the Hebrew Shêchâr.

14. Oxos, vinegar.
15. Dĕbash, or "Honey" (Gen. xliii. 11; Ez. xxvii. 17) was the usual term for the inspissated juice of the grape, characterized more especially by sweetness. Boiled down to onethird or even one-half of its original bulk. It is in common use in Syria at the present day.

This list will shew that the question of alcohol is complicated by the differences of opinion that evidently still exist among Biblical commentators and translators regarding the true nature of some of these beverages, &c. But on the whole these definitions may be received. There can be little doubt that the wines of Palestine in Bible days varied in quality according to locality, even as they do now there and in other wine-producing countries. It was the locality that gave their names. Thus the wine of Helbon, a valley near Damascus, was prized in ancient times at Tyre (Ex. xxvii. 18) as it still is. So also that of Lebanon was prized for its aroma (Hos. xiv. 7). And clearly it would be more satisfactory if the different varieties of Bible wine and fruit products and beverages were more clearly differentiated either in the text or by marginal note: thus Tirosh wine, Eshishah wine, Asis wine, Sobhe wine, Chemer wine, and so on through the fifteen different varieties.

It will be noticed that Tirosh, Eshishah, Asis, Sobhe, and Chemer are all simple, bland, nutritious, non-intoxicating varieties. And that on the other hand, Shemarim, Mesheck, and Shechar are old, drugged, and strongly alcoholic. And, judging from the Bible texts so translated, some contend that the Scriptures enjoin total abstinence from wine and all other alcoholic beverages: and it is well to consider on what grounds they do so. The advocates of this doctrine point out that where the word Tirosh occurs its use is spoken of as a blessing, and is almost invariably praised (Ps. iv. 9; Prov. iii. 10). But at the same time they maintain that, as this term means "grape fruit" and not a liquid at all, this furnishes no argument in favour of their use, or proof of the benefit of alcoholic wines and beverages; nor does it sanction our indulgence in them. Nay, even though Tirosh did mean, as some translators aver, the sweet, unfermented, non-alcoholic juice of the grape, a liquid as bland and as harmless as milk, those Bible texts which command it would not encourage or sanction the use of alcohol, wine, or other spirituous beverages, either of that era or of the present day. It is only just, however, to point out that even Tirosh is decried in one passage, and that very decisively. Thus whoredom and wine (Yain) and new wine (Tirosh) take away the heart (Hos. iv. 11). This doubtless is meant to deprecate its engrossing influence, especially if taken often and in quantity.

Again, Eshishah, or grape cakes (2 Sam. vi. 19); Asis, or

grape droppings (Amos ix. 13); Sobhe, or boiled grape juice (Is. i. 22); and also Chemer or unclarified grape-juice (Deut. xxxii. 14), are all praised on the whole, and may therefore be regarded as permitted enjoyments. They are all simple, bland, nutritious, and non-intoxicating. So that their rational use can hurt no one: and no one can adduce the Bible sanction of these as an argument in favour of modern wines and other alcoholic liquors. Thus the first five of the above varieties of Scripture "wine" may be put aside as witnesses in the argument for or against the use of alcoholic beverages. This necessarily lessens the kinds on which we have still to sit in judgment to the last six, all of which are liquid and principally alcoholic. Of these Shemarim or old wine on the lees, is spoken of favourably once (Is. xxv. 6); and warned against twice (Jer. xlvii. 11; Zeph. i. 12). Mesec or drugged wine is strongly condemned in accordance with the dictates of common sense (Ps. lxxv. viii.; Prov. xxiii. 10). Shechar, or strong, fermented alcoholic liquors, are also invariably spoken of in terms of disapproval; and forbidden to be used in sacrifice to God (Lev. ii.); or to be drunk by the Priests (Lev. x. 9); or by Nazarites (Numb. vi. 3); or by the people for ordinary drink (Prov. xx. 1; xxxi. 4; Is. v. 11-22). Nothing special is said to enable us to infer the nature of Oinos. But in the New Testament its use is sometimes sanctioned; and in other instances condemned. This arises most probably from two different kinds being alluded to, one of which was fermented and intoxicating (Ephes. v. 18); and the other unfermented, therefore non-alcoholic and harmless (John ii. 1-18). Again Gleukos (Acts iii. 13) probably means an intoxicating wine. But the only passage in which it is mentioned does not sanction its use. Clearly, therefore, none of these varieties can be adduced in testimony of the permitted systematic use of the wines and other alcoholic liquids of the present day, any more than they can those of Bible times. Even Shemarim, the variety which most closely corresponds to modern wine, is alluded to in terms of warning.

The chief interest of the argument therefore, as to whether the terms in which the wines, &c., of the Bible are spoken of, sanctions or disapproves of the use of alcohol and modern spirituous beverages, lies in the remaining word Yain; that is in the term which occurs oftenest; and is found not only in the writings of all the sacred penmen, but in every variety of circumstance, sometimes in terms of approval, in other cases as a permitted enjoyment, and in others in loud and decided tones of warning and admonition. For once it is approved of, however, it is condemned thrice. The bearings of this fact can only be explained by supposing that the term is a general one and includes several different kinds of wine; and not only the fresh

juice of the grape (Chemer), but also the fermented juice (Shemarin), and also drugged wine (Mesech). The first of these is meant when its use is either praised or not blamed; and the latter two when it is cautioned against on account of its intoxicating tendency. So that Yain also, like other varieties of Bible wine, clearly does not sanction the use of either ancient or modern alcoholic beverages. The quantity taken has also much to do with the praise or blame attached to Biblical Yain. And in fact it may be averred that when wine is disapproved of and strongly condemned, it is sometimes the variety chosen which is the cause of this, and sometimes the quantity taken, and its excessive use expressed or implied. And that in both cases it is the resulting intoxication which is disapproved of. On the other hand, where any kind of drink is spoken of in the Bible without reproof, or with praise, it doubtless implies a moderate use of it, whether it is of the intoxicating or non-intoxicating varieties. Alcohol and alcoholic beverages thus become classed in Holy Writ with other mundane things. Abuse of various other things by way of excess is also decried in the Bible. For example, food, study, pleasure, &c. So also is the abuse, *i.e.*, the excessive use of alcohol. While, on the other hand, its moderate and abstemious use is praised, or at least not decried.

Some of the Bible texts speak very strongly against wine, denouncing it as "destroying and deceiving man," and as being "the poison of dragons and venom of asps" (Deut. xxxii. 33). Nine passages of Scripture expressly prohibit it in certain cases. While five wholly forbid it under all circumstances. Hence it is reasonable to infer that where this occurs, it is clearly the alcoholic and the drugged varieties that are meant. Of the whole number of texts in which the word wine is mentioned, only 24 speak of it as a permitted enjoyment. And these no doubt allude to simple, unfermented, non-alcoholic grape juice or *must*, like that now so much prized by the people of modern grape-growing countries, though uniformly used mainly or only by these on account of the difficulty of getting and keeping it elsewhere.

It was doubtless this variety of wine, namely, non-alcoholic grape juice, that God desired as a drink offering (Ex. xxix. 40); which Solomon likened to wisdom (Prov. ix. 2); that Jesus made at Cana (John ii. 2); that David credits with "making glad the heart of man" (Ps. civ. 15); and that is figuratively alluded to in the passage, "Ho, everyone that thirsteth come buy *wine* and milk without money and without price (Is. lv. 1.).

There is, however, one grand Biblical historical fact in the early history of the Hebrews which incontrovertibly proves that alcohol and alcoholic drinks are not an absolute necessity to Man under any one of the many different conditions of human

life; and it is this, that during the whole of the forty years' wandering in the Wilderness, the Israelites used water mainly for drink, even under the most trying circumstances, including heat, fatigue, anxiety, grief, hunger, thirst, sickness, &c.

Still, the Bible unquestionably approves of alcoholic wines and spirits under certain conditions and circumstances, especially when they are required medicinally. Thus "give strong drink to him that is ready to perish, and wine to those that be of heavy heart" (Prov. xxxi. 6-7), may be regarded as professional hints for the judicious physician, that are often acted on. In many serious ailments, as in certain heart, brain, and lung troubles requiring temporary or prolonged excitation, when there is great mental and bodily depression, so that life is at a low ebb and requires stimulation to help it over its difficulties and prevent it succumbing to its morbific adversary; wine or spirit wisely, that is medicinally, employed, have doubtless saved many a valuable life. In such cases the best forms, such as pure claret, hock, moselle, port, sherry, champagne, cognac, gin, whisky, &c., free from fusel oil, and therefore with no effect on the frame except a stimulant one, and certain to cause no sense of weight in the head or dulness of ideas, exactly fulfil the Biblical indications here pointed out. The wine (Oinos) which Paul recommended Timothy to take "a little for his stomach's sake and his oft infirmities" (1 Tim. v. 23) was doubtless a tonic, strengthening, mildly alcoholic variety. So that in mild ailments a wine of this class may also be legitimately and beneficially employed, after Biblical example.

Thus the true interpretation of the Bible teachings regarding wine and spirituous beverages generally appears to be as follows:—

1st. Unfermented wine, that is *must* or grape juice, is alone almost invariably approved of, and therefore permitted.

2nd. While neither total nor habitual nor pledged abstinence from alcoholic beverages, or their use in moderation, *i.e.*, their temperate use, are strictly enjoined by the Holy Scriptures, the second and fourth of these, *i.e.*, habitual abstinence or temperance, according to circumstances, appear to be indirectly suggested and advised.

3rd. Their excessive use, however, that is their abuse, is invariably strongly condemned.

4th. Their judicious medicinal employment is approved of when this is either necessary to preserve health or to cure disease.

5th. Abstinence, pledged or non-pledged, as occasion may require, to help others against the folly and sin of over-indulgence, is praised and thus indirectly enjoined.

Taking a broad view of the whole subject, it may be said that it is with this as with other matters; the Bible as a rule plainly and distinctly *enjoins* whatever tends to promote God's honour or our neighbour's welfare. And, on the other hand, it as clearly *forbids* whatever may lessen or injure one or both of these; as, for example, idol worship, sabbath breaking, murder, theft, and so forth. While again it only *cautions* against those which may militate against ourselves; like the unwise use of alcoholic beverages. The reason for which is plain. We are here as free agents, but still in ordeal. As such, but yet endowed with the monitor conscience to enable us to discern between what is right and what is wrong: gifted more or less also with the mental counsellor called common-sense, and furnished, moreover, with the Bible as a guide-book; we can either indulge or refrain from them at will, and thereby obey or disobey God, with the sequel, retention of health or the risk of losing it. In short, it is with this as with all of the other enticing things of this world and all of our desires and appetites. But it is equally evident that even when it is necessary to use the permitted or the medicinal kinds either of wine or alcohol, the Holy Scriptures clearly and emphatically inculcate *temperance* in this as it does in all other matters involving human health, life, and happiness.

This is proved by the fact that the Israelites are cautioned against surfeiting (Hosea iii. 1); that is against harming themselves even with grapes (Tirosh), or with grape cakes (Esishah); or with grape droppings (Asis) (Is. xlix. 26); or with boiled grape juice (Sobhe) (Nahum i. 10). Again, the New Testament warns against "walking in excess of wine" (1 Pet. iv. 3). St. Paul gives a similar caution when he says "Be not *drunk* with wine" (Ephes. v. 8). The same Apostle subsequently inculcates that "a deacon should not be given to *much* wine" (1 Tim. iii. 8); doubtless largely for example's sake. In these instances unfermented wine is doubtless mainly meant. Again when he advises the use of fermented wine he clearly suggests that it should be employed in moderation thus, "take a *little* wine for thy stomach's sake" (1 Tim. v. 22).

Evidently, therefore, according to the Holy Scriptures, the unnecessary or excessive use of alcoholic beverages is only one of the natural or acquired appetites and desires against which we have to contend; which we ought to use our utmost self-control in trying to check, especially as the Divinity condescends both to warn us, and aid us in our efforts against the allurement. We are even cautioned against their moderate use: mainly because this is apt to open the door of temptation to greater indulgence in an alluring but depraved, if not sinful taste; their excessive use being clearly so much the worse. Drunkenness is

reproachfully termed "a work of the flesh" (Joel i. 5). Wine-bibbing is classed with gluttony; and wine-bibbers with publicans and sinners (Mat. xi. 19; Hosea iv. 11; Hab. ii. 5). The use of *much* wine, a phrase that clearly indicates a slighter degree of intemperance, is reproved by Solomon (Prov. xx. 1; xxiii. 29). While woe is predicted for drunkards (Is. xxviii. 1-7). And those of that class are enumerated among those heinous offenders who are to be excluded from the Kingdom of God (1 Cor. vi. 9-10; Gal. v. 19-21).

While Holy Writ decidedly does not decry habitual abstinence; approves of temperance when we do indulge; and distinctly condemns intemperance: it is clearly not the use, but the abuse, of alcoholic beverages, that is their use in hurtful excess that is animadverted on and deemed unadvisable according to Scripture teaching. It is thus with this as with all other good and beneficent things of earth. We may partake; but if we do we ought to cultivate moderation. And, so, evidently with this object in view, the Bible clearly defines what is the proper way of using them in these terms, "Be not *drunk* with wine wherein is *excess*" (Ephes. v. 18). The Apostle knew that the necessity for the use of this, or any of the other forms of spirituous liquors; and also the quantity which may be considered necessary, within the bounds of legitimate use, wise, and temperate, of course vary according to individual peculiarities, mental and physical constitution, age, sex, size, and so forth. And, to decide regarding this, personal experience and common sense must be our main guides. As a general rule, however, it may be well to remember that whenever digestion is interfered with, the senses, intellect, or locomotion impaired, we may be certain that the quantity taken has been too great. Nor should partakers ever forget the growing desire, and the seductiveness of the habit of indulgence; or cease to carefully ward against its social, moral, and physiological dangers (Rom. vii. 18-19).

We may thus conclude that in this, as in other matters, Scripture and science, ancient Bible teaching, and modern medical experience agree; and that—

1. Habitual or complete abstinence is advisable for all whose health can bear it; that is for the majority of people.
2. That habitual abstinence is especially necessary, and indeed obligatory, both from a sanitary and therefore from a moral point of view, for those with whom alcoholic beverages, even in small quantities, disagree or intoxicate.
3. That, for example's sake (1 Cor. viii. 10-13), when it can be borne without detriment, total abstinence is praiseworthy, if not obligatory.

4. That, except for those included under the following head, *temperance* should be the law and rule for those who find it a health duty to occasionally, frequently, or regularly and systematically take wine or some other alcoholic beverage.
5. That frequent and even occasional intemperance is wrong; and not only a sin against God's moral code; but also against his hygienic laws and laws of health; and therefore doubly likely to be punished.
6. In some severe diseases, attended or followed by great debility, *e.g.*, fevers, alcohol in some form is unquestionably life-saving, and alone sufficient to support the system for days together; although its therapeutic and clinical uses cannot be discussed here: the main question now being its dietetic value.
7. That, either as a medicine or as a diet drink alcohol is safest when taken and subsequently left off by medical advice.
8. When given for disease or debility it is tenfold more necessary than in health that wine or alcohol should be pure and good.

CHAPTER IV

AIR

"The breath of life" (Gen. ii. 7; Job ix. 18; xii. 10; Ps. civ. 29).

An abundance of pure air is the most constant and urgent necessity of animal existence: and to none of the many different forms of earth-life is it more so than to the copestone of the animal creation, the human race. Without this invisible mixture of gases the human body could neither begin, nor could it continue its wonderful career. It is the first indispensable which promotes the vivification of the infant frame, even before birth. And one of the last physiological phenomena of the worn-out or disease-stricken body is the cessation of respiration, that is the inhalation of air into the lungs. Food and drink are requisite for our existence. But air is far more so; and we cannot live many minutes without it. Moreover, health is most vigorous and life longest, other things being equal, when the supply of air is abundant and pure. Indeed, air is one of the essentials of health as it is of life. And, when health is lost, air in abundance and purity is tenfold more necessary to throw disease off and enable the body to regain the vigour and bulk it has lost, than it is in health. For hygienic purposes it is also well to remember that we live in and breathe the lowest, and therefore densest stratum of the atmosphere, that next to the earth's surface: where, for obvious reasons, it is most apt to be most vitiated and rendered deleterious both to health and life; not only by unavoidable animal, vegetable, chemical, and physical processes, constantly in progress in earth, air, and sea, but by Man.

Air which may be termed physically and chemically pure, and therefore best adapted for human respiration and existence; is a transparent, invisible admixture of gases and watery vapour, containing the following ingredients:—

Oxygen - - -	21 per cent.
Nitrogen - - -	79 „
Watery Vapour - -	70-80 „
Carbonic Acid Gas -	·03 to ·06
Ammonia - -	a trace
Nitric and Vapour -	ditto
Ozone, Argon, Helium Krypton and Tenon	ditto

Although not the most abundant, the all-important vivifier and life necessity, oxygen, is the active physiological ingredient. When the amount of oxygen is diminished by the presence of some other gaseous ingredient, which takes its place, either inert and neutral or actively poisonous and hurtful, life and health languish, disease ensues, and death perhaps ultimately follows. The other ingredients vary within certain limits, beyond which there is danger to health or life. Ozone doubtless is an aerial disinfector. The rôle which ammonia plays is possibly more connected with the vegetable world than with animal life or Man. The part which nitric acid and the lately discovered argon, helium, &c., play towards Man's life and health or his diseases and hygiene are not yet known. Nitrogen is probably merely a diluent of the oxygen. The only ingredient the variation of which is comparatively unimportant is watery vapour or moisture. This may vary from great dryness to complete saturation: and in either case cause comparatively little detriment either to health or life. It is the varying amount of these different ingredients, especially the moisture; which, added to the constantly changing temperature density, motion, electric condition, light, magnetism, and so forth, which combine to form those many and widely different varieties and characteristics of air found in different places and conditions of latitude and altitude; or even in the same place at different times, to which we give the terms atmosphere, weather, season, and climate.

That life cannot exist for many minutes under a total deprivation of air is practically shewn by death from drowning and other modes of suffocation. Again the dire effects of a deficient supply, not amounting to total deprivation, is illustrated by the well-known disastrous results of the Black Hole at Calcutta on the confined British prisoners: of whom out of 146 no fewer than 123 died in a single night of eight hours' length. Statistics prove that when pure air is less stinted than in this notable example, it not only directly but indirectly induces disease and ultimately even death. Moreover, when a limited supply is prolonged many serious evils, and a still larger number of minor troubles result. In order to fully understand why this is so it is necessary to be aware of certain facts in the physiology of human respiration. This does not, as often supposed, consist merely of an inspiration or inhalation of air, and its expiration or emission immediately or soon after, unchanged as it went into the lungs. The physical act of respiration is not a simple pneumatic process which involves the breathing in of pure air and breathing this out again unmodified. It involves an important and complex chemical exchange; so that the ordinary air we expire is very different chemically, physically, and vitally, nor so pure and healthy as that we

inspire; because in the lungs, cells, and bronchial capillary tubes the salutary oxygen of the atmosphere is absorbed through the exceedingly fine mucous membrane into the blood, and replaced by an outflow of carbonic acid from the body waste. Moreover, the more or less abundant watery vapour in the air of inspiration is replaced by another danger-laden element, namely, organic matter from tissue waste. With these two combined the healthy function of respiration is therefore fraught with a certain element of danger, even to the individual. We constantly inhale a life-sustaining gas; and as frequently emit a poisonous one. So that from this source alone, the chemical composition of the air we breathe is important, and fraught either with health or with disease, according to circumstances; because, even individuals are thus apt to make a poison and thereby seal their own disease or even death warrant. It is largely this diminution of oxygen in expired air, combined with an excess of carbonic acid and organic vapour, that cause the evil effects of overcrowding in houses, rooms, halls, &c., and makes their stuffy and contaminated atmospheres so devitalizing and deleterious to health. Pre-breathed air of this sort is exceedingly poisonous; mainly from poisonous exhalations from living and dead animal tissues; and powerfully poisonous even if from healthy animals. The blood lacking its vitalizing oxygen and charged with two powerful poisons, carbonic acid, and liquified organic matter depresses and perverts the activity of the dominant brain and general nervous system; besides poisoning every other tissue; so that every organ and function becomes perverted. Probably individual Man excretes from his lungs and skin in 24 hours more poison, only more diluted, than a deadly snake manufactures in the same time. This humanly vitiated air is specially harmful to consumptive patients. Human beings are clearly everywhere apt to be subjected to the dangers of impure air in small unventilated or badly ventilated rooms and houses, especially when these are overcrowded; numbers adding materially to the danger.

It is instructive to follow the sequence of events that flow from the re-absorption of these poisons from other people's lungs, and even from our own. The semi-oxygenated blood first becomes black, impure, unhealthy, and not only unfit to nourish, renew, and vivify old tissues in adults, and make new ones in the young; but also unable to sufficiently stimulate the muscles to move, brain to think, nerves to telegraph sensations or desires, and the different glandular organs to secrete or excrete bile saliva and other usual and indispensable matters in due quantity and quality. The result is that life languishes, health suffers, and the frame may ultimately succumb. Even if the latter event does not occur it makes the individual feel dull,

stupid, fretful, peevish, despondent, full of aches, pains, moods, and offences against himself, his neighbour, and even his God. In short, he dons that condition often described as unchristian. Moreover, that weak state of frame is induced which predisposes to the induction of various, serious, and well-known maladies, such as scrofula, consumption, and so forth. In all such cases the general contaminated air which induces these dire results becomes vitiated by the breath and other excretions constantly radiating from the human body. At the same time it is possibly not altogether or mainly those two contaminations, carbonic acid and organic matter, that injures or kills, so much as want of a fresh supply of pure air and the resulting deficiency in the percentage of the all-important and all-invading vital stimulus, oxygen.

Altogether apart from and independent of this personal or human contamination it is only in country districts, on upland regions, or on mountain sides that what may be termed pure air may be found. And, perhaps, the greatest danger to human health and life arises from impurities introduced and added not from the human body, but by mundane processes carried on in the animal, vegetable, or mineral departments of the world we inhabit, which, so to speak, soil the pure air of heaven, especially its lowest strata, those next the earth's surface, and vitiate it by impurities of gaseous, vapoury, or even solid nature, filling it with minute, often microscopic, dust and debris of every conceivable kind: which are oftener and more directly hurtful and even deadly to Man, by being carried into the lungs, body, and blood by means of the air we breathe and the all-important and necessary respiratory process. These additions to the atmosphere may consist of invisible vapours and noxious gases, smoke, &c., from factories, &c., or malaria and other emanations from the soil or its produce. Or it may be very fine and microscopic particles from the earth, our clothing, dwellings, trades, &c. Or it may consist of a world of vegetable life only lately discovered, but which plays a most important rôle in creation, and especially in human life; namely minute ocularly invisible but highly dangerous and often deadly microbes or bacteria and their still more minute germs, which cause the most frequent and serious diseases that have afflicted the human race in all ages. In such air lurks and lives the microbe of phthisis, which slays about one-seventh of the human race. In it are also found the germs of leprosy, the most frequently mentioned, because no doubt one of the most dreaded and loathsome diseases mentioned in the Holy Scriptures. Likewise the germs of the large and feared class of infectious and contagious disease which in all ages have so decimated our race. And also the seeds of many other human ailments. These vegetable dust particles, at once

the most silent and unseen but most subtle and deadly of all our body foes are blown about in the air or carried by water far and wide, entering thus our houses, till they meet with a suitable soil, the body and tissues of a predisposed individual, in whom they locate and develope. Into the tissues of our frame they gain admittance, all unknown to the individual they attack, either by the lungs and air we breathe or by the stomach and food we eat; and fluid we drink; or from the articles with which our skin comes in contact. In the blood and tissues these parasites germinate with marvellous rapidity, and by their inconceivable numbers slay their victim, partly by starving his tissues, partly by germinating noxious matters and poisoning him.

The impurities which thus contaminate the air we breathe effect their disastrous results in various ways, according to their nature. Noxious gases and vapours are first inhaled into he lungs, and thus enter the blood; carried by which they speedily spread over and poison the entire body, sooner or later, more or less, according to their concentration. The lengthy respiration of even a trivial aerial impurity, say from gas or vapour evolving stagnant water, factory, sewers, &c.: and even the "close" atmosphere of many private dwellings, especially bedrooms, in which most people spend so much of their lives, is also a very frequent cause of debility and ill-health; especially among children and adolescents, whose undeveloped and delicate frames are not only particularly susceptable to unsanitary agencies of this sort, but also less able than mature adults to withstand them.

Solid aerial impurities in the form of fine dust, and which carried about by the breeze and drawn thence into the lungs by the respiration; are also apt to create serious pulmonary disturbance and even disease of various kinds, mainly by mechanical irritation of the breathing organs: thereby often initiating deadly ailments, *e.g.*, phthisis. Fine coal dust frequently causes consumption among miners; so does fine sand chippings among stone cutters; steel dust among knife and scissor grinders. Indeed there are greater or lesser risks to health and life from this cause in nearly all employments, especially indoor ones; thereby making the hygiene of trades a special study and an important one. And the knowledge of this sanitary danger clearly renders it necessary to take careful and persistent precautions to minimize and if possible neutralize the dangers arising therefrom, to which the health and lives of all, especially the majority, *i.e.*, the poor and the working classes are constantly exposed, particularly men, women and children engaged in the more unsanitary occupations. Thus, while pure air is healthy to breathe; Man's own body is apt to contaminate it; so are other animals; so is the wear and tear and emanations

and productions of the earth itself. These all contribute to vitiate the originally pure atmosphere; notwithstanding Nature's wondrous efforts to preserve and restore purity; so that it is difficult to find perfectly pure air except on mountain tops or at sea; and difficult to avoid the many diseases which arise directly or indirectly from air more or less and very variously vitiated. And it is well to remember that, although the warnings of our senses are salutary, and therefore make themselves valuable detectors of some noxious aerial impurities, solid, liquid, and gaseous; some of the most frequent and dangerous of these air vitiators, especially the most dangerous, because invisible gaseous ones, have neither taste nor smell; so that the tongue and nose can no more than the eye be deemed an infallible or trustworthy test of atmospheric purity or impurity.

From this it will be seen that even open-air life may be deleterious to health and life, by reason of atmospheric impurities. It will also be evident that, as some of the gravest impurities are often derived from Man himself and his occupations, the impurity of the air we have to breathe as an imperative necessity of life is necessarily apt to be greatest where the human race is most concentrated, as in cities and towns. Moreover that it is apt to be still more impure where the atmosphere is confined, stagnant, and seldom renewed, as in houses, halls, and especially in bedrooms during the long hours of the night. Also that it is apt to be still more contaminated in workshops, factories, mills, mines, &c., where human chemical and physical impurities are concentrated and the ventilation often defective. Hence the necessity for a special and separate study of urban, suburban, and rural hygiene; the hygiene of dwellings, workshops, factories, camps, and ships; that of trades and occupations; all of which are frequently fraught with varying degrees of danger to human health and life; and mainly so from atmospheric impurity and its pathological and poisonous effects.

It will thus be evident that the purity or impurity of the air of our globe, and especially of that we breathe, so far from being a matter of indifference, is one of primary import; as it influences the health and life and therefore the happiness and prosperity of all classes of mankind, especially persons engaged in various trades and occupations. Recent statistics of the Registrar-General for Ireland illustrate this point well, by shewing the unequal mortality among different classes of the people of Dublin, especially those of different occupations. Thus, among families of the "Independent and Professional" classes the annual death-rate was 24·6 per 1,000. Among the middle classes it was 29 per 1,000. Among the artizans and petty shopkeepers it was 28·2. Whereas in the "general service" class and inmates of workhouses it was 48·8 per 1,000. This increas-

ing mortality as we descend the social scale can only arise from an increase in surrounding insanitary conditions. And, among the chief of these factors of premature decay and early death is unquestionably impure air; air vitiated in various ways and degrees by dust, gases, vapours, &c., of many different kinds and varying virulence.

Frequent or even constant indifferent health and much real disease is still more apparent from the same cause. Among the occupations thus rendered unhealthy, that of grindstone making heads the list; the average lifetime being not more than about 24 years. Then come fork-grinders, who live on an average 29 years; razor grinders who die at 31; and edge-tool grinders, who may live to be 32. These examples will suffice to shew the evil effects of the respiration of very fine dust, earthy or metallic. Entering and irritating the lungs with the breath these ultimately lead to consumption. So that of every 100 sick men, grindstone makers, 99 of them are consumptives; the percentage among flint-cutters and glass-cutters being 80; among needle-grinders 69·6; and among cotton-dressers 60. Similar statistics might be given of other trades, where the impurities are not solid dust, but gaseous or vapoury. The practical bearing of this will be still more evident by remembering that among the 8,500,000 people engaged in manual labour in Great Britain, about one-tenth part of them are employed in these or other more or less unhealthy industries. In this tenth part the average duration of life is only 45 instead of 55 years; the latter being the fair average duration of a working-man's life. Again, whereas 12 per cent. of the entire death-rate is due to consumption; this is no less than 26 per cent. in these insanitary occupations. Moreover, while the average working life of an artizan is 40 years; in these insanitary occupations it is only 30 years; that is one-fourth less. The effect on the working industry of Great Britain is thus, from this cause, as if every fourth man of the total number of artizans had never existed at all; that is 212,500 men. The loss to the working class from this cause in the shape of wages is necessarily enormous, and something like 11 millions of pounds yearly. While the loss to the country by this death of wealth-producers may be estimated at one-fifth, that is 20 per cent., that is £2,200,000 annually. To this must be added the waste of money for feeding, clothing, educating men who do nothing to repay their parents or the nation, but are simply swept away.

Being more subtle, less easily detected, and so avoided, impure air is more dangerous to us than impure food or drink. And it is not generally known that the oxygen in the air we breathe is largely retained by the blood, solidified and incorporated into the tissues, or used to promote the corporeal functions and make

its secretions and excretions. Necessarily also the evil effects of deficient and especially impure air are materially increased when other unsanitary agencies are conjoined; such as scanty or inferior food, deficient clothing, heat, or sleep, undue anxiety or fatigue, intemperance, overwork, overcrowding, defective drainage, and such like. This unfortunate combination of morbific agencies is a common occurrence in daily life; in all but especially among the ill-fated working classes and the poor.

Moreover, it is well to recollect that impure atmospheres have a secondary and indirect influence on mankind. Inasmuch as their physiological effects react on the morals and lead to crime. Thus, to the corporeal and mental depression caused by impure air in dwellings and workshops, can often be traced the drinking habits of the poorer classes; a craving for stimulant being thus created. And, as the natural and healthy one, oxygen, in pure air is lacking and out of reach, they fly to the unsatisfactory and artificial ones, malt and spirituous liquors.

Fortunately for mankind we have not to depend entirely on each other or even on ourselves for removal or diminution of the danger. Nature either takes away or devenomizes some of these many and frequent impurities from the atmosphere in her own beneficent and generally simple fashion; thus ever restoring the air of our human lower stratum to its normal or healthy state by its wonderful system of compensations. But for this the air we breathe, especially where the race is most densely massed, would very soon become so vitiated as to be unfit to sustain life as it now exists: thus—

1st. Some of the most noxious gases, notably carbonic acid, is absorbed by plants; these in turn giving out others, especially oxygen, which is healthy and useful to Man and his respiration.

2nd. Other aerial impurities, especially organic ones are oxydised by the ozone of the normal air, often most abundant where it is most required, to render these inoccuous by converting them chemically into something else.

3rd. One of the chief uses of the different winds and aerial circulation of the globe is to promote human life and health in this manner, by Nature's ventilation. The Creator has so ordained that noxious-like healthy gases and vapours tend to mix and thus become diffused, the morbific being thus diluted with the sanitary ones and so rendered comparatively harmless. Thus it is that malaria are often disseminated and prevented from harming Man. The many different winds that everywhere blow aid this diffusive and dispersing process, and render the lower or earth-

stratum of air so apt to become noxious, less dangerous by removing and scattering all kinds of impurities over higher and less dangerous regions where Nature's chemistry decomposes or her cold sterilizes and kills them; their place below being replaced by purer air.

4th. Suspended dust, both visible and microscopic, inorganic and organic, falls generally by its own weight or is beaten down and then washed away by the rain.

By these various modes Nature keeps the general atmosphere in what we may term a fair state of purity; one at least sufficiently fit for human respiration, health, and life.

But many of these beneficent efforts and much of Nature's sanitary kindness is prevented by the exigencies of modern civilization, and the effects of climate, season, and weather. These compel many to live in dwellings, and to do much of their work indoors. Houses give greater warmth and seclusion. But they are apt to have certain sanitary disadvantages. For it is thus that the emanations from human bodies, cooking, washing, sewerage, the dwelling itself, and its contents, or the trades carried on therein, are apt to become pent in, especially in winter, when, in excluding cold we are sure to keep foul vapours, gases and dust in; which, if permitted to remain, are apt to weaken us and ultimately cause disease, perhaps death.

Hence, whenever possible, these contaminations should be removed as constantly and effectually as practicable; and as fast as they are formed, and fresh, *i.e.*, pure, air introduced to take their place for satisfactory respiration. In other words, the atmosphere of dwellings, workshops, factories, halls, theatres, churches, and above all the stifling and highly contaminated air of low-class private houses, crowded tenements, bedrooms, &c., should not be permitted to stagnate, but constantly renewed from without. Where there is no escape for the impure, confined, and no entrance for the purer external air, as is likely to happen, we ought to make one. Briefly, as the *natural* ventilation above spoken of by dispersion and diffusion is prevented by the walls and roof, we should resort to *artificial* ventilation.

The best modes of satisfactorily effecting this renewal of air is one of the great puzzles of modern hygiene; and is, moreover, a subject too extended to enter into here, although of the highest interest and importance. It will suffice here to add that to ensure the utmost attainable purity of the atmosphere we breathe, so desirable for all, it is a matter of great moment everywhere and under all circumstances to have our dormitories, dwellings, workshops, and our public halls, barracks, shops, churches, &c., properly ventilated. And of equal import that children so tender and easily affected by insanitary agencies, should have well aired public and private schools and school-

rooms. That our fellow creatures compelled to work should have airy, not over-crowded tenement houses, stores, workshops, warehouses, factories, barracks and ships. That our aged, infirm, and poor should have well ventilated hospitals, homes, asylums, and workhouses. And even that our criminal classes should have well-aired reformatories and prisons.

Whenever it happens, as it often does, that individuals or bodies of people cannot regulate the ventilation of the building in which they may happen to work or live, to have this done for them is no less a matter of duty to them, than of safety to ourselves as individuals, citizens, units in a community, a nation, and a race. For in this manner, by giving them purer air to breathe, we may laudably assist in making our fellow-citizens, and thus perhaps the entire race, healthier, more vigorous, and longer lived. While again, by giving domestics, children, workpeople, and even paupers and criminals, pure air by efficient ventilation and cleanliness, we may often prevent the development of widespread and deadly epidemics; a serious result, inasmuch as in these and the vortex they occasion, we ourselves, or those dear to us, may ultimately be disastrously involved.

These are not mere theoretical and utopian propositions, barren of results, but suggestive and pregnant facts; from the full acceptance and practical application of which valuable consequences have already accrued. Thus the improved health which follows "change of air," whether this is to warmer or colder, to dryer or moister, to elevated or insular regions, is largely due to the increased supply of this necessity of life, pure air to sedentary people and valetudinarians. Excellent results by way of increased appetite, strength, and health follow an open-air life, even in debilitated children and young women. Here they respire nothing but pure air, and do not re-breathe their own breathe and emanations. The same fact is even more true and certain in disease. That the health-restoring efficacy of "camping out" in cases of debility and even in cases of confirmed phthisis, is as great as its health-preserving power, was long since pointed out by Blake; and more recent experience confirms this fact. To give another definite instance:—On finding that the mortality among children in the Dublin Maternity Hospital about ninety years ago amounted during the first fortnight of life to one in every six children, of whom, moreover, nine in every twenty died of lock-jaw, Dr. Clarke happily thought of improving the ventilation and general hygiene. By this innovation alone he soon reduced the mortality to one in every $19\frac{1}{3}$. Again Collins, by subsequent hygienic changes (1826-8), reduced the death-rate to 1 in $58\frac{1}{2}$; while only one-ninth of the deaths then occurred from lock-jaw. A similar increase in health and a corresponding diminu-

tion of disease and mortality unquestionably follow every improvement in the ventilation of private dwellings, especially sleeping apartments, as well as that of public buildings, small and large, shewing what an important factor in our daily life, both in health and in disease, a *full* supply of *pure* air is; and how necessary is its renewal. Nor should it be forgotten that it is not fitful and intermittent but *constant* attention or inattention to the minute details of such hygienic matters of proper ventilation and air renewal, like this that in the end makes the sum total either of health or of disease. And that while to preserve the former requires life-long efforts: a very brief forgetfulness of even one of the laws of health, such as this one of ventilation to obtain pure breathing air may induce the most serious and perhaps fatal results; as proved by the history of the majority of the diseases that have befallen mankind from the primal pair down to the present day.

Biblical and Mosaic Hints Regarding Air

The atmosphere which plays so important a rôle in the physical economy of the globe; especially in the animal and vegetable worlds of life, and in our own human existence, is not very often alluded to in the Holy Scriptures; but when mentioned it is in especially pregnant language, usually of physiological, pathological, and hygienic import and value, even at the present enlightened day. The vital importance of this animating agent to mankind cannot be better indicated than by the Biblical expression "breath of life" (Gen. ii. 7); and by the interesting circumstances under which the phrase is employed, namely, the creation of the primal pair that initiated our race. Herein the Holy Scriptures enlighten us from whom we derive our being, in the language of the Creator who made us. Job repeats this, "the breath of the Almighty hath given me life" (Job xxxiii. 4; Acts xvii. 25). No other volume can so veraciously record this all-important fact, who gives Man his being and initiates his vitality. The Bible likewise informs us that all mankind are equally indebted, not to Nature but to its Maker and ours, the Being "in whose hand is the breath of all" (Job xii. 10; Dan. v. 23). Also that all mankind breathe the same animating agent, "they have all one breath" (Eccles. iii. 19); the mouth (Ps. cxxxv. 17); and the nostrils (Lam. iv. 20), being the inlets by which it is inhaled into the lungs or organs which absorb and utilize it. The same being who initiates our being ends it for "God sendeth His spirit and we are created; He taketh away our breath and we die" (Ps. civ. 29-30). Our health is made to symbolize our life for brevity

and uncertainty, "for what is our life, a vapour" (Jas. iv. 17; Job vii. 7), so frail is the tenure of both. Although the Holy Scriptures therefore do not say much about the external air, or its relation to Man in the respiration; or regarding ventilation for the healthy renewal of air; what it does say and advises, is as usual with all Biblical matters, very apposite and suggestive.

The Bible says nothing special about impure air or ventilation necessary for its removal. But the great danger of the former, and the vast importance of the latter, even in such favourable places and such circumstances as those under which the Israelites of the Exodus found themselves, are shewn indirectly and forcibly by the carefully planned and executed public hygiene of the Hebrews; evidently intentionally pointed out and recorded in the Pentateuch (See Hygiene of the Camp Vol. 2, Chap. 20, and Hygiene of the Hebrew Tabernacle Vol. 2, Chap. 19); because in many respects highly suggestive and educational for all people and for all time. One of the primary aims of this throughout is to shew the benefits of well ventilated tents and tent-life; and especially that the instant removal of garbage, ashes, excreta, sacrificial refuse, and lepers, was clearly mainly meant to ensure not only perfect cleanliness of camp tents, earth-surface, and every person and article in the camp; but for the secondary and all-important object of keeping the air, so important for the Hebrew respiration, free from noxious smells, and especially from disease-generating matters, dust, vapours, and gases. And it was a notable practical illustration of a doctrine comparatively recent in secular medicine, though taught by the Divinity and the Bible long ere it was thought of and epitomized in the modern proverb, "prevention is better than cure." By these hygienic precautions the necessity for ventilation was materially lessened; and reduced to a minimum, as contrasted with the extent to which we now find it necessary to practice air-renewal, owing to our practically less perfect sanitary arrangements, those of ordinary life.

The Israelites of the Exodus were better circumstanced than most modern nations to have pure air, and by it to enjoy better health and live longer. Like the nomadic shepherd patriarchs of pre-Mosaic Bible times, they lived—and slept in what was practically the open air. And did this in a mild, balmy climate, that of south-west sub-tropical Asia, as previously in healthy Goshen, and subsequently in healthy Judea. This climate was neither too hot nor too cold for their scantily-clothed skin; and was just adapted for a practically open-air life like theirs. Tents permitted the impure gases and vapours thrown off by the body and household processes to be freely carried off by natural ventilation, the wind, and diffusion of gases. By day theirs

would be mainly an open-air life, the healthiest of all; for many would wander or work amid their gardens, flocks, and herds, beyond the camp; while those who kept near their tents would enjoy clean and healthy interspaces, with practically pure air, which the tabernacle sacrificial fires would constantly help to renew by their intentional central ventilation by uptake (see Camp and Tabernacle). The Israelites had little didactic teaching as to the danger of impure air in tent, camp, street, and tabernacle; but their practical education on the point and in camp ventilation was remarkably precise and apposite, as laid down in the Mosaic Code, which was to be their rule of conduct as long as the race lasted: and adapted not only for their frequently shifted camps but for their subsequent but perhaps less healthy, though more permanent, homes in Judea.

Can we doubt that the great and special salubrity of the Jews of that day and their freedom from many ailments which afflicted contemporary nations, was largely due to the pure air they breathed and this healthy and judiciously planned open-air life. True they were under Jehovah's special protection for life and health, so that even their feet swelled not (Deut. viii. 4) but was not the regulation and enforcement of their carefully planned system of hygiene one of the main means by which the Divinity effected His beneficent purpose; and purity of their respired air one of His chief agents; for all at least who then obeyed His sanitary laws. It was distrust and disobedience at Kadesh that kept these early Hebrews so long out of Canaan and wandering in the Wilderness, and for which all those who left Egypt died in the Desert. Was it disobedience, distrust, and neglect of Jehovah's sanitary laws; and this important one regarding the vital value of pure air for respiration by night and day, and from year to year, that led to the premature death of that mighty host of originally strong adult men, numbering at least 600,000; by inducing fatal organic diseases that cut them off while still mostly in the prime of life? Jehovah's hygienic laws can no more be disobeyed without punishment, than can any other of the other laws of Nature. That Man should respire pure air is one of the most vital of laws.

After the settlement in Canaan and occupation of fixed and more solid abodes in villages, towns, and cities, the hygienic circumstances and environment were necessarily considerably altered. Each community would have to look after its own aerial supply and purity. And thus under combined advantages and disadvantages. Houses would have a less free circulation and renewal of air, so that ventilation would be more necessary to keep the air healthy than in tents and the Desert. But these houses were fairly open; and their flat roofs permitted the inhabitants to spend much of their time there for amusement,

occupation, sleep at night, social intercourse, and prayer; and practically gave a largely open-air life; and this their weather often permitted. This was highly sanitary, and materially lessened the necessity for systematic ventilation and all the appliances to which we are now obliged to resort to attain air purity. Moreover, the Mosaic law regulating speedy removal of unsanitary matters, continued to help to keep the air sweet and thus preserve the general health. Disease generating agencies were thus prevented and the inroads of disease, epidemic, and otherwise. We hear little in the Hebraic after times in the Bible about infectious or contagious disease; or indeed of pathological trouble generally; and may thus infer that the Hebrews were both healthy and long-lived: for which their well-devised public and private sanitary system, and their original hereditary vitality, are largely to be credited. Though at the same time their study and practical attention to the sanitary part of the Mosaic Code had doubtless become less ardent, as it more patently was to the higher hygiene of that wondrous code, progressively towards subsequent Messianic times (Mal. iii. 7).

Clearly, therefore, the Holy Scriptures fully teach that, altogether independent of its import and necessity for commerce, our human interest in the atmosphere that enwraps our globe is great and preponderating from a medical, physiological, pathological, and hygienic point of view; and that it is a vital necessity for our individual and social well-being. Remove the air from our globe; or deteriorate it beyond a certain ratio, and the race would soon become extinct by widespread disease, caused partly by foreign deleterious admixture in the form of gases, vapours, and unhealthy dust, but mainly from lack of the oxygen which we are daily and momentarily breathing, absorbing, and utilizing by convertion into our different solids and fluids, its bone, muscles, nerves, skin, blood, &c., and our many different varieties of force, and our varied secretions and excretions.

Thus God in His Holy Scriptures, inspired and written over 3,000 years ago, supplied and now supplies both Hebrews and Gentiles with information that we can obtain nowhere else; and regarding which we should have, even in the present enlightened age, remained in indecision if not in ignorance; because the most erudite of his creatures among men could never of themselves have found it out. The inspired writings of Jehovah's servant, Moses, point out definitely what Socrates and Plato failed to discover, and only faintly guessed at; truths which the not less gifted or favoured but devout scientists like Sir Isaac Newton and Sir David Brewster investigated and fully received.

The facts regarding Air and Man and their mutual relation that the Bible thus illustrates are:—

1st. Who it was that created our race; and bestowed not only our bodies and souls, but also that mysterious something we term life.

2nd. What is the agent designed by our Maker and Preserver to first start the vital machinery of our frames; to keep the life going; and by its withdrawal to end it and set the soul free.

3rd. That *breath* or *air* is the vitalizing agent necessary to begin the many and different bodily processes, and not only keep these in healthy action, but also restore their health when this is lost.

4th. It also teaches inferentially by the care taken to give that race which Jehovah designed to be a model and exemplary one in all things, pure air; how necessary it is that the gaseous element or food we inhale should be as near as possible what we so term it, pure, unvitiated, free from noxious admixture.

5th. It likewise tells us inferentially that the air is most apt to be contaminated by emanations and debris thrown off by the earth itself or by its animal and vegetable productions, especially Man.

6th. It also shews how best to meet, and either lessen or prevent this never-ceasing contamination: *a*, by hygienic methods of prevention, especially excessive and constant cleanliness of everything and everybody; and *b*, by instant removal of impure air and the agents which cause it, when these do occur by judicious ventilation; and, lastly, *c*, by chemically disinfecting the air and the people who inhaled it.

The Bible, and especially the Pentateuch, thus records, among many other things appertaining to human sanitation, how fully, efficaciously, and practically Jehovah "informed, guided, and taught" (Ps. xxxii. 9) the early Hebrews, and through them us, both Jew and Gentile, and our successors, till time shall end, the vital use and value of the earth's atmosphere to humanity and all living things, whose very existence depends on a due supply of oxygen and air.

EXERCISE

"Labour tendeth to life" (Prov. x. 16; Eccles. v. 19; Exod. xx. 9).

CHAPTER V

Physiologically defined, this word means functional activity of the entire body, and in a more limited sense, of its individual organs or parts. The popular definition, however, is, use of the muscular system, and indirectly of the circulatory and respiratory systems which this brings secondarily into play, thereby to indirectly influence the entire frame. From birth to death, work in moderation and duly apportioned to rest and food, is essential to human life, health, and happiness. Exercise is also one of the great promoters of the appetite, sleep, and strength. And, therefore, for several reasons, Man was clearly born not to lead a life of laziness, but to work.

Thus the exercise and labour, to which we are often so averse, are not altogether grievous or unmixed evils; as they carry the above-mentioned benefits in their train. Hence, viewed from this standpoint, the great primal curse and the very necessity which overcomes our natural sloth, often proves a blessing in disguise. Man, as a rule, *must* have occupation or be miserable. We are happier with the toil which we can overcome by industry, than we could have been with spontaneous plenty and unbounded profusion. Both body and mind are improved by that which fatigues them. And the subsequent pleasure is a thousandfold enhanced by the work which precedes it.

Man, the most highly developed creature in this earthly creation, and in whom alone of all the animal world the spiritual is blent with the material, is specially fashioned for work. His hands are made for mechanical action; his limbs for conveyance to it; his brain for planning its details; and his muscles for performing it. To learn to work, and to labour cheerfully is one of the great lessons of life. An idler is therefore an anomaly in creation. Complete idleness is never met with in Nature; and least of all in the human body. Even when this is apparently at rest and even asleep, every function and organ in the frame, heart, lungs, stomach, circulation, respiration, digestion, secretion, &c., are all constantly going on. Even the brain is ever busy more or less by night and day; and if not judiciously, is apt to be unsatisfactorily employed.

The physiology of exercise and labour is simple. The ordinary life and action of the muscles, nerves, brain, glands, and other bodily organs, even the bones, involves a waste of material. This waste is either of their own particles, or of food and oxygen purposely stored up either in the tissues or the blood, to enable these to carry on their several functions. In ordinary circumstances, that is in healthy conditions, this constant waste is met as fast as it occurs by fresh supplies of air and aliment: so that the body does not wear out, but is kept about its normal size, weight, energy, and efficiency, no matter what may be the amount of activity to which it is subjected. But the body and its different organs are meant to be used; and are not intended to be kept perfectly still, or excused from work, lest too much waste be thereby occasioned. On the contrary, experience shews that it is when kept for any length of time in a state of inactivity that this waste occurs, even though the individual is amply fed. The shrunk and weakened limbs of the fanatical Fakirs of India furnish an example of this. But while this shews that inaction is detrimental, moderate exercise on the other hand is not only beneficial but necessary. The very exercise which increases the renewal of tissue and causes the constant reconstruction of the frame piecemeal, cell by cell and fibre by fibre, likewise promotes its health; increases its stored-up vitality, so necessary for occasions of special energy and effort; and thereby prolongs its life. And, since sunlight is nearly as necessary to perfect health as pure air, the best labour and exercise are those taken out of doors. Therefore it happens that, under judicious exercise the body and its several organs and parts, instead of wasting and decreasing, actually grow both in size and strength. This proves clearly that this is beneficial and indeed necessary to health. Every part and organ, as well as the entire body, grows and flourishes as it feeds; and it feeds in proportion as it works. If under-exercised or wholly unexercised, the body and its organs, one and all, cannot continue to be altogether properly nourished. Hence it happens that, without exercise the human frame, especially the organs of animal life, namely the muscular and nervous systems, would ultimately wither, shrink, weaken, become soft, flabby, and subject to fatty degeneration; and would ultimately thereby end their thereby shortened career by inducing some serious disease. Whereas, under judicious exercise, or work our different tissues, organs, and the frame would become stronger, healthier, more active, and longer lived. Nay, under judiciously chosen calisthenic exercises even some deformities, especially of the chest, may be cured; the weak system invigorated, its symmetry restored to its proper form, and elegance in deportment induced.

Moderately active work is salutary if merely enough to stimulate healthy waste and repair; and not sufficient to exhaust the body or any single organ or set of organs; and especially the faculty of recuperation and repair. On the other hand overwork and underwork are both equally detrimental. When it is prolonged and exhausting it becomes morbific, owing to the waste of tissue being then more rapid than its renewal. When defective it becomes morbific because renewal of tissue is then imperfect. Nevertheless idleness is oftener a curse both to individuals and nations than heavy labour would be.

When it is possible, therefore, both of these extremes should be avoided. And the exercise should be such as to develop every organ, part, and function without neglecting any. Above all there should not be over-care of the muscles to the neglect of the brain and vice versa. The healthiest individuals are those in whom muscle and brain are developed and cared for side by side by judicious training and careful attention to both the muscular and the nervous systems after a regular method. Proper exercise calls into play and stimulates the faculties of recuperation and the restorative energy. But it should never exhaust the nervous energy, or exceed the capacity of the body or part for recuperation. Overstrained exercise, whether local of a set of muscles, or general of the entire body, is a certain forerunner and promoter of disease at all ages. And, as undue exercise is apt both to induce and to increase lesions of the Thoracic organs, it is always judicious to examine the lungs and great vessels before indulging in these.

Our frequent craving for work of some kind when in a proper frame of mind, indicates its suitability and healthiness. And the innumerable forms of recreation which Nature has so lavishly strewn around us, and our varied capacity for different kinds of exercise, indicate that it is not only a natural but also a beneficial instinct. The earth, the sea, and the air furnish us with ample change and inexhaustible opportunities for its indulgence. And, in a thorough acceptance of the boon we find not only enjoyment but also health, strength, and long life.

If the curse of labour incurred by our first parents, that "In the sweat of thy brow shalt thou eat bread" (Gen. iii. 19) fell equally on the race, and every individual had to labour at some occupation for a living, each of us would have exercise enough to keep the body in a satisfactory state of health. But this part of the primeval curse is not universally distributed. For, though the largest part of the world's population always has and always will consist of the labouring classes: there is still, as with the nobles in the days of Hezekiah, a large number who never "put their neck to the work" (Neh. iii. 5); and who have little mental or physical exertion, but lead an indolent and often luxurious

life. And for such the voluntary labour which we style "exercise" or "recreation" is absolutely necessary for health. Hence the value of its different forms, such as athletics, calisthenics, gymnastics, and other sports of the not too barbarous and brutalizing kind, which bring all the muscles of the body into play and furnish both exercise and amusement.

It has been abundantly proved that judiciously conducted exercise and recreation materially assist the mental as well as the physical development of the young; while they give vigour, suppleness, and health to the adult, and strength to the weakly frames of all ages. Any person can easily prove this by a wisely-selected course of personal training; under which the muscles grow strong and wiry, the chest expands, the appetite, strength, and health improve, the brain thinks more clearly and justly, the various organs perform their functions more satisfactorily, mind and body grow more elastic and buoyant, while threatened disease is often warded off. An official enquiry into the results of gymnastic exercises instituted at a military school in France over a period of six months has established the following facts:—

1st. That the muscular force is increased on an average from 15 to 17 per cent., and occasionally from 25 to 30 per cent.

2nd. That the force has a tendency to become equal on both sides of the body, thus making it symmetrical.

3rd. That the capacity of the chest and consequently the breathing power are increased by one-sixth at the lowest.

4th. That the weight of the individual is increased from 6 to 7 per cent.; and occasionally from 10 to 15 per cent.; while the bulk of the body is diminished; thus shewing that the profit is confined to the muscular system, while superfluous fat is removed. The same official enquiry further proved what has been already alluded to, namely that to be beneficial, exercise must be judicious and moderate, since the increase in muscular force was confined to the first three months of the course. After which a serious diminution occurred when the exercise was not decreased. Marey's observations on the effect of training shew that the respiratory curve is increased by exercise. After a month the respiration in repose becomes as ample as formerly, after a long run. After six months the curve is four times as full; the rhythm being only half as quick and no longer modified by exercise. Experiments made in America have proved the beneficial effects of physical training. Thus, in a Boston

normal school for teachers, in which the graduates were about equally divided between the sexes; in every one of the ten classes the best gymnast was a woman. While in all, the removal of corsets, heavy skirts, and the use of vigorous exercise resulted in greatly improved health. Similar results occurred in a school for young women at Lexington. The age of the pupils averaged 17. Many were drawn from wealthy families. All were subjected to a new and peculiar regimen, embracing hard and unremitting work, to determine the possibility of improving their physique during the period of school-life, and a severe curriculum of study like that of young men in some German Universities. The average gain for eight months about the chest was $2\frac{1}{2}$ inches; round the waist 5 inches; round the arm $1\frac{1}{2}$ inches; and round the forearm one inch. In no instance did they fail to improve in health. In none did the extreme stridings and other vigorous exercises of the extremities and the body, even at critical periods, produce disease, distress, pain, or disturbance of the natural functions of the body. In many cases backaches, palpitations, and other sufferings disappeared; and the original half-invalids could soon perform the full gymnastic work of the school, dance three evenings a week, walk five to ten miles of an afternoon, and feel that they were only beginning to live. Regulated physical exercise and examination of the bodies of young children, boys, girls, grown persons, and even old people, to develope the muscular system are as necessary as examination and exercise in mental studies to develop the brain, nervous system, and intellect. There is practically no kind of physical exertion, and especially the ordinary kinds, rowing, walking, running, climbing, riding, swimming, and so on, which is in itself necessarily detrimental to the body, especially to the heart, lungs, muscular, and nervous systems, which are chiefly called into play then; when care is taken not to make it too violent and not to compress it into too brief space of time: inasmuch as when the latter is done then it is apt to prove mischievous, especially to the four great systems now mentioned.

To the middle, and especially the upper classes of society, systematic exertion, such as is pleasurable and not prolonged to over-fatigue, is an invaluable means not only of preserving health but also of prolonging life. The heavier work of the mechanic and labourer, on this side of exhaustion, likewise con-

tributes both to happiness and health, two enjoyments which wealth cannot purchase nor indolence taste. And experience proves that among all classes, rich and poor alike, idleness, laziness, dreaming, and reverie are not only irksome, but also weakening; and ultimately both disease-inducing and life-shortening; while activity, useful exertion, or labour are healthy. The former are particularly culpable in the young and strong. Nor should an abundance of physical exercise incident to their different forms of play, for which Nature has wisely implanted an unconquerable fondness, ever be discouraged in girl or boy, but the reverse. At all ages, in the old as well as in the young, Nature's demands are imperative, and must be acceded to, since to all she is a stern and merciless creditor.

Moreover, the healthy activity of the body and the brain are closely allied. A strictly healthy frame of mind is almost incompatible with a weak or sickly body. As a rule the mind is permanently most vigorous when the body is strongest. And the reason is obvious. The brain is merely a part and organ of the body. Whatever affects one influences the other. Noted muscular activity and great brain-power are often allied. And among all people, savage and civilized, those who exercise daily are as a rule not only the healthiest and longest lived, but have also the strongest and best balanced minds. At the same time dissimilarity of work should be studied when possible. Even among labourers, strictly so called, a lengthy continuance of the same kind of work or exercise is not only irksome but detrimental both to mind and body. While a change to another variety, even one which is equally arduous, is a pleasant recreation. It relieves the tired muscles, nerves, brain, &c., and other organs and functions, and is therefore judicious. So also mental exercise and exhaustion, often harder and more trying than physical, are best relieved by change of study.

The physiological and pathological results of underwork are laziness, corpulency, and sundry bodily and mental affections. Those that follow excessive exercise are over-fatigue of body and brain, and even more serious consequences. So that it is wise of all in this as in all else to aim at a happy medium. In youth emulation tends to carry us beyond the just amount of bodily and mental exercise. In advanced life the reverse is apt to lead to morbid inactivity of brain and body, or both. These follies should clearly be guarded against by bringing reason to guide us.

The selection of the kind of labour, exercise, or recreation is also usually left to personal preference. In this, as in other matters, tastes differ; and each one selects according to individual necessities, circumstances, and surroundings. Fortunately the choice is ample. And between walking, riding, boating,

driving, running, wrestling, fencing, boxing, swimming, and other forms of exercise in ordinary use; and also amateur carpentering, gardening, and so forth, there are few persons, however fastidious, who cannot be agreeably suited. For women walking is healthier as a rule than driving. And nothing suits them better than gymnastics, swimming, cycling, tennis, golf, &c. Swimming, judiciously conducted, not only exercises the muscles in the open air, but is the best of tonics for the skin, and the body generally. Women should be careful of indulging in the more violent amusements such as golf, hockey, cricket, &c.: and only strong, wiry ones should indulge.

Such recreations as those quoted, and many others not named owing to their numbers, are not only good for the healthy, but especially so for those with weak frames, and even for those afflicted with the minor deformities. For example, round shoulders, stooping gait, or flat chest, &c., can often be much improved and even cured simply by judiciously conducted mild home gymnastics in the open air or a well ventilated room. It has been proved that a few minutes' exercise each day, as by rowing, will increase the girth of a lady's biceps muscle by two inches a year: an amount sufficient to make a thin arm plump and firm. So also the same amount of exercise will convert a flat into a full chest by from 4 to 6 inches. An increase of 3 inches to the girth of the chest is equivalent to an addition of 50 cubic inches in the capacity of the air cells of the lungs. This again means an increase of lung power, and that again of augmented vitality of every organ, good blood, a clear eye, fair complexion, springy step, high spirits, strong brain, and an increased enjoyment of life.

As with individuals so with nations; the strongest peoples are those who are fond of healthy exercise. Moreover, as a rule, those who are physically weak are also mentally inferior. And it is now well recognised as an axiom, that the prosperity and the future of a nation depend much on the physical and mental health of the individuals who compose it. The physically healthy and the mentally enlightened ones hold their ground best, and ultimately come to the front in the struggle for existence and survival of the fittest. Not those who are only highly intellectual; but those in whom there is a judicious combination of both. Highly enlightened but physically weak nations, in whom the brain is developed at the expense of the body, are likely to die out or succumb to physically stronger races. So also, tribes which are well developed physically may be crushed by others that have a higher degree of enlightenment, and thereby greater skill in traffic or in war.

The most heroic peoples of ancient times, especially the Greeks and the Romans, made their manly sports a national

event. Public places were set apart to enable all to indulge in this luxury. Their soldiers also wisely practised these games much, to improve their strength and activity. The earliest recorded public display of athletic sports was at Rome, B.C. 186, where they were introduced by M. Flavius at the close of the Ætolian War. They afterwards became exceedingly popular in the time of the Emperors. To be an accomplished athlete was considered highly honourable; and the national pensions and statues rewarded successful ones. These ancient games were not of a degraded but exalted nature; such as running, wrestling, and so on. And in them all the aim of the contestants and audience was not corrupt, but pure and lofty; seeing that they were meant only to promote the physical development of the individual, and thus of the race: and the many beneficial results that flow therefrom. Hence even the most famous philosophers were not ashamed and did not deem it undignified to practice athletics and exhibit their skill. Pythagoras, Euymenes, Chrysippus, Cleanthus, all attained considerable fame as athletes; the former two having won prizes at games at Elia. The physical training of the Greeks and Romans is a subject not less attractive to the sanitarian than to the athlete and the antiquary, inasmuch as from both sources many wise practical hints may be gleaned worthy of attention in modern times. The most splendid renowned games were the Greek Olympics, which drew spectators from all parts, especially to witness boxing, running, wrestling, and chariot races. The Greeks and Freemen of Charades who competed were subjected to a long and severe regimen (1 Cor. ix. 24; Phil. iii. 12-14). It is worthy of notice that among the Greeks physical training was associated in one of the oldest Greek legends with the practice of medicine. Cheiron taught Achilles and Apollo not only surgery but also bodily exercise. The two things a Greek most desired was health and manly beauty, the result of physical training, desirable first for soldiering and second for private citizenship. Greece may be said to have been the home of the gentleman amateur. Greek children played very much as ours, the most popular games being ball, hoops, see-saw, knuckle bones, tug-of-war, blind man's buff, leap frog, building toy houses, modelling boats and animals. Horsemanship held the first place in the physical training of youth, begun at seven years. Soon after they entered the public gymnasia, where properly regulated exercises were carried out under the direction of a gymasiarch, who exacted implicit obedience and proportioned the exercises to the age and strength of the learners. These exercises consisted in foot races, that were considered of great importance. A common form of contest was five-fold, namely, 1, running; 2, leaping, especially the long jump; 3, wrestling, 4, disc throw-

ing; 5, the spear. Among the Romans physical training was somewhat different. Their great institution and amusement was the bath, with exercise enough to keep the body in training. The patricians and better classes were fonder of witnessing professional athletes than in joining in their exhibitions.

Though rapidly advancing civilization has materially changed the nature of the public games; as it also has the aims, customs, and feelings of the participants, the laudable public interest in manly athletic sports is not spent; but, on the contrary, is yearly increasing. For modern as well as ancient experience shews that, as with the enforced drill and voluntary recreations of soldiers and sailors, so the physique of private citizens is also best kept at the highest standard only by the constant practice of judiciously chosen athletics, gymnastics, and manly sports. Communities and nations are therefore wise that afford all, especially the working classes of both sexes, who most require it and have least time and fewest opportunities for gratifying the desire, facilities for voluntary recreation and exercise: that provide open public squares, gardens, and parks for walking; gymnasia, rinks, baths, skating ponds, playgrounds, &c.; and that add to these, facilities for dancing, racing, boating, swimming, diving, cricket, and other healthy amusement in which exercse and excitement are judiciously combined; and from which no physical, mental, or moral harm can result when training and gradual preparation are made. Diversions like these of the less rough and brutalizing kind should not only be encouraged, but, if necessary, judiciously enforced by legislation, especially among the young, and wherever no natural desire for it exists. Thereby may private disease and mortality be largely diminished, and consequently public and private salubrity, vigour, and longevity greatly increased.

At the same time we should provide that due care be taken that the exercise is judicious in amount, time, and place. Otherwise, instead of fostering health we may induce disease. Altogether independent of the accidental injuries apt to occur by carelessness; certain ailments are liable to be produced indirectly by athletic sports carried out under unfavourable auspices or indulged in too freely. For example, almost any game may be carried on to over-exertion; which re-acts on the heart, causing palpitation. And this again may lead as a rarer effect to syncopal or fainting attacks from heart strain; that organ having too much to do to supply the wants of the system, materially increased under exercise. And perhaps subsequently leading, if prolonged to muscular degeneration of the heart tissue, or irritable heart; or to secondary lung strain. On the other hand, prolonged exposure to the rays of a very hot sun during these exercises may induce convulsive attacks, thermal

fever, or heat stroke. As with all other amusements, athletic sports in moderation are health-giving; their abuse is just the reverse.

And, that athletic exercises in various forms and degrees are not only compatible with godliness, purity of life, and health of body; but also great, and indeed indispensable aids to their development and continuance, now receives the fullest recognition and finds popular and widespread expression in the phrasing and practical outcome of "muscular Christianity."

Biblical Hints Regarding Exercise; Pre-Mosaic, Mosaic, and Post-Mosaic

The law of labour was one of the institutions of Paradise; Adam having been put there not to be idle but to cultivate the garden, even in the days of his innocency, and before his "fall," which made it compulsory to toil for bread (Gen. ii. 16). Labour, even then, in Man's pristine happy state, and altogether apart from his lapse from grace, purity, and peace, was not only pleasant but profitable, inasmuch as it was good for Man's intellectual, moral, and physical well-being; and calculated to keep the entire frame and entity in tune and make rest sweet. Jehovah therefore wisely and purposely imposed it. It was equally so after the fall; only that sad mistake compelled Man then and ever after to "toil" for subsistence (Gen. iii. 17-18). Compulsory and continuous labour is far less pleasant to humanity generally than that which is voluntary and occasional. In Paradise work was either light or begat little sense of fatigue. After the fall, however, bodily labour induced exhaustion, as it still does; a legacy and memento of the Edenic transgression. Work then became toil; and that which was lately voluntary and agreeable, became compulsory and less pleasant. And the hint, "study to do your own business and to work with your own hands" (1 Thes. iv. 11), is as applicable to that early period of human history and the present day as it was to New Testament times.

Rightly viewed, therefore, work is not degrading, but noble and sanctified. The Deity is the most active, untiring, and potent of workers. Nature, His handiwork, animate and inanimate, is never at rest. The air, earth, sea, and all they contain; and not only this world but also every other orb, nay, the wide creation, constitutes a mighty scene of ceaseless activity, physical, physiological, and spiritual, in performing the will of their mighty Maker, and pursuing each entity its own individual destiny. So, too, our great Exemplar was never idle while on earth, but worked hard and went about "continually

doing good" (Acts x. 38). And although "there remaineth yet a rest for the people of God" (Heb. iv. 9), a promise from which we may infer that in our next stage of existence we shall renew our former paradisaic privilege, and suffer neither worry nor fatigue as now; we shall not be idle, even there, but ever busy. Work "to a nobler issue" will then be our privilege and delight; as then we may be even more truly than here "fellow-workers with Him" (1 Cor. iii. 9) who made and redeemed us. Therefore while here we ought not to be wilfully idle; but should rather regard it as both a privilege and an honour to be employed in legitimate work (1 Cor. iii. 9). As creatures made after God's image, and though now deeply debased, still imbued with some of His attributes and tendencies, it is only when engaged in health-giving work of beneficent kinds that Man most resembles the ever-busy Creator (Gen. ii. 2; Ps. cxi. 2; Job xxxvii. 14); the equally active Saviour (John xvii. 4; iv. 34; v. 17; ix. 4; v. 36); and also the higher intelligencies (Ps. xci. 11; 2 Kings xix. 35; Mat. iv. 6; iv. 11; Mark i. 13; xiii. 39; Luke iv. 10; xv. 10; 1 Thes. iv. 16; Jude ix.; Heb. i. 14).

Comparatively little is said directly in the Bible generally regarding work, exercise, or recreation, at least by way of advice. It is the same in the Mosaic era and history of the Hebrews of the Wanderings. The latter doubtless arose because:—

1st. Jehovah kept them pretty busy by frequently moving their camp, which necessitated a considerable amount of work in tent and tabernacle pitching, camp arranging, cleaning, &c.

2nd. Their Priests and Levites had enough exercise in connection with the numerous sacrifices, offerings, and tabernacle duties. So had the oft-sinning and sacrificing people. Their isolated and nomad life, and the design of their institutes and laws, was to preserve the knowledge and worship of Jehovah; and not to develope them into a commercial or manufacturing or even a military nation, but into a God-fearing one. No special work was therefore given beyond their earlier pursuits as shepherds. This they had largely to follow to supply their numerous compulsory sacrifices and food consumption.

3rd. In the dry, sandy, or rocky and mountainous desert there were few opportunities or inducements for pure recreation; and their health was specially protected without it.

4th. Jehovah fought for and led them; and there was no need for special military drill, military sports, and

exercises. But it seems not at all improbable that Moses, the ex-general, developed their military instincts somewhat; inasmuch as during a later period of Hebrew history, when settled in Canaan, often less obedient to God, more self-willed and self-reliant, the Hebrew youth were taught the use of the bow (1 Sam. ii. 20; xxxv. 40); and slinging of stones (Judg. xx. 16; 1 Chron. xii. 2); both used in warfare then.

Recreations and amusements among early peoples consisted of festivities with music and dancing; at weanings such as that of Isaac (Gen. xxi. 8); at weddings, sheep-shearing (1 Sam. xxv. 36; 2 Sam. xiii. 23); harvest homes, birthdays of sovereigns (Gen. xl. 20; Mark vi. 21). Scripture gives few notices of juvenile games: yet no doubt the Hebrew children had amusements, toys, and sports peculiar to their age. But manly games were not much followed up by the Hebrews; their character being too stolid and the climate unfavourable. The chief amusement of the men apparently consisted in conversation and joking (Jer. xv. 17; Prov. xxvi. 19). A military exercise seems to be alluded to in 2 Sam. ii. 14. In later times gymnastic sports and games were introduced into Jerusalem in imitation of those of Greece, by the High Priest, Jasor, and subsequently by Herod. Paul frequently alludes to the Greek contests, the boxing, wrestling, leaping, running, quoiting, hurling the spear, &c. (2 Tim. iv. 7; 1 Tim. vi. 12; 1 Cor. ix. 25; 2 Tim. ii. 5). For these a long course of training was necessary (1 Tim. iv. 8), during which a particular diet was enjoined (1 Cor. ix. 25-27). The contests took place in public (Heb. xii. 1; 1 Cor. iv. 9; Heb. x. 33). The games were begun by the proclamation of a Herald (1 Cor. ix. 29). The rules were strict (2 Tim. ii. 5; 1 Cor. ix. 27). Paul alludes not only to boxing (1 Cor. ix. 25), but most frequently to running or the foot-race (2 Tim. iv. 7). These games are given as symbolic of our heavenly course and the ardour with which it should be pursued (1 Tim. vi. 12-19).

The Holy Scriptures do tell us, however, as it did our predecessors, and in strong language that work and recreation are not only good but necessary. And it does this not only by shewing their physical, mental, moral, social, and spiritual advantages, direct and indirect, but also by indicating the disadvantages of the besetting sin of idleness and sloth. Bodily and mental labour alternated are invariably praised and therefore by inference commended and enjoined. This proves that they are good not only for our worldly prosperity, strictly so-called, but also for health of body and intellect. While the converse, laziness, is invariably blamed, thereby shewing that it is detrimental. And clearly, if labour and exercise are good, the minor forms

in which we indulge for amusement and recreation, must be equally salutary.

Many texts might be quoted approving of judicious bodily and mental work, and above all of regular and congenial occupation; and to shew that it is beneficial in a physical as well as in a business point of view. God commands us to work (Exod. xxxiv. 21), shewing thereby that it is good for us. He rewards labour by making the sleep which follows it sweet (Eccles v. 12); and also healthy, for the "labour of the righteous tendeth to life" (Prov. x. 16). Diligence in business is meritorious and invariably praised and blessed by God both for time and eternity (Prov. x. 24; xii. 23; xxii. 19; xvi. 3; xvii. 4; Eccles. v. 18-19; 2 Chron. xxxii. 30; 1 Thess. iv. 11; Deut. xv. 10; ii. 7). The Scriptures enjoins every man to enjoy the good of all his labour, as it is the "gift of God" (Eccles iii. 13). Sanctified labour is certain of reward; for "seest thou a man diligent in his business he shall stand before kings" (Prov. xxii. 29). The labourer is worthy of his hire and his food (1 Tim. v. 18; Luke x. 7; Mat. x. 10). And Heaven shall bless the work of Man's hands (Job i. 10).

On the other hand, that bodily and mental idleness, laziness, and sloth are hurtful, invariably disapproved of, and threatened with punishment, is shewn by many texts (Prov. xxxi. 27; vi. 9; x. 26; xiii. 4; xx. 4; xix. 15; Eccles x. 18; 1 Tim. v. 13; Rom. xii. 11; 2 Thess. iii. 10; Heb. vi. 12; Mat. xxix. 26). The penalty is not only of a worldly nature like poverty (Prov. xx. 13), but also of a more serious kind, namely, loss of health. Thus "Go to the ant thou sluggard, consider her ways and be wise" (Prov. vi. 6-9), contains both a warning and advice. Mankind generally should be "not slothful in business" (Rom. xii. 11). Soloman hated this vice, and always speaks of the sluggard with great contempt (Prov. xii. 27; x. 26; xxii. 13; xviii. 9; xxvi. 13; xvi. 24).

The amount of ordinary bodily and mental labour, or of their minor forms, exercise and recreation, necessary for or consistent with health, is not mentioned in the Holy Scriptures; because no fixed law or stated amount can be laid down for either, as this varies with individual strength, constitution, and other circumstances. What the labourer or the man of busy brain calls recreation may be deemed hard work for a more delicate person. So that now, as then, each must judge for himself. The amount is left to our own decision and estimate, basing these on common sense and experience, on the supposition that each will individually and as a duty take the necessary amount and avoid idleness on the one hand and overwork on the other; remembering that it is possible to take too much,

and still more easy and pleasant to have too little; and that it is better to err on this side of fatigue.

Here, again, therefore, as with all other hygienic matters, we find our modern ideas regarding exercise, recreation, and work, corroborated and endorsed hundreds of years ago, and in the case of the Mosaic Code thousands of years back, by the ancient Scriptures, *i.e.*, by the Divinity, whose teaching has practically remained a dead letter for so long.

CHAPTER VI

SLEEP AND REST

"So He giveth His beloved sleep" (Ps. cxxvii. 2). "The Lord shall give thee rest" (Is. xiv. 3)

The exceedingly complicated and delicate machine, Man, cannot be always at work; even at that form of it which we term recreation or play. The different tissues, organs, and functions, and the human frame, as a complete entity, require change, relaxation, and perfect rest; especially the muscular system and the ever busy nervous system, consisting of the brain and mind, which control, regulate, and dominate, correlate and guide all of the other systems and everything we think, say, and do; and their appanage, the universally distributed system of nerves or telegraph wires, by and through which these central organs act. In the midst of hard mental or physical labour Nature kindly warns us by inducing a sense of weariness that we must intermit this by repose. And if we then leave off for a time the lull rests the tissues that have been employed, refreshes and fits us generally for further toil, and we return to our avocation, whatever that may be, with renewed vigour. Rest is therefore a hygienic duty as obligatory and as sacred as that of work. As a rule those who rest best work best. So that practically doing nothing is often indirectly a profitable employment from this sanitary point of view.

But this kind of rest, an intermission of our ordinary work, is not enough for our sanitary necessities. We are so fashioned that our bodies periodically require the more complete rest that we term *sleep*, "tired Nature's sweet restorer," during which we live a passive semi-vegetative life, which gives Nature time to recuperate; and

1st. Arrests for a while further waste and metamorphosis of muscle, nerve, and other tissues.

2nd. Promotes repair and restoration of the tissues and organs already wasted.

Our province and aim here is not to discuss the anatomical and physiological phenomena or the physical cause of healthy sleep; all still much debated points; or to say whether it ensues from deficient oxygenation of the blood; or from accumulation of waste products in that vital fluid; or from cerebral anæmia;

exhaustion of brain tissue; or some periodic rhythmic necessity of the organ and the general system, necessary for due nutrition and health. But sleep can scarcely be said to be solely confined to the brain and spinal cord. That organ begins, most fully fulfils the function, and carries it on to a close; but it also spreads it by the countless nerves over the entire body, till every organ, function, fibre, and cell quiets down into that semi-comatose condition; so that not unfrequently when the brain awakes first we may continue for a time to feel inert and half-asleep all over the body. During sleep pure abstract thought, feeling, and motion are in abeyance; the body at rest from its toil, the brain from its workings, the heart from its troubles. In this mysterious condition not only the brain and entire nervous system, the organs chiefly involved, but every organ, molecule, and fibre in the body partakes more or less. The heart beats more softly, lungs breathe more lightly, secretion proceeds more slowly, the muscles and different organs of special sense are all stilled. This lull in vitality is so general and complete that sleep has been poetically yet practically termed the "death of each day's life." Nature, moreover, has so ordained that the desire for sleep should periodically come when it would be least convenient to work, namely, when earth is shrouded in night and all animate creation is still. Sleep is thus doubly hygienic; first, by preventing disease from overwork; and second, by permitting repair of wasted and weakened tissue and function and resting and recuperating the careworn mind, all over strained, fatigued, and so temporarily prone to disease by the day's labour.

The imperative necessity for rest and sleep is universal in both of the two great kingdoms of life, the vegetable, but especially the animal. For this special purpose the functions and growth of plants are partially checked at night; they practically go to sleep then. Thus Holmes has lately shewn that while the vitalizing sap of the birch tree spreads over it at the rate of 7 to 8 ounces an hour under the stimulating influences of the daytime, especially solar heat and light, it only rises at the rate of four ounces by night, that is about one-half. For the same purpose, the vegetable world has also its longer winter repose of the same nature. It is this nightly rest and winter vacation that re-invigorates and makes them so active by day and also during spring-time, as compared with other periods. So also animals, both the least developed and the most highly organized require sleep, or hybernation, the condition which corresponds to it. Moreover, the necessity for periodic rest is one of the most important laws which govern the health and life of the human body. Without the peaceful rest of the hours of night Man's bodily and mental activity would not be recuperated fully.

As with work, so with sleep, the amount best adapted for health varies with circumstances. As a rule, and for an obvious reason, namely to recruit their strength, labourers require more than inactive or indolent people; males more than females, because they work and think more; children than adults, to aid growth. From five to eight hours per day is the allotted range. Some persons naturally require more and others less than the average. Night is the natural and therefore best time for sleep. Broken rest, and especially deficient or omitted sleep are detrimental to the brain and nervous system, and through them to the entire body, which cannot then remain long in health, by the breakdown of one or more organs or functions. Over-fatigue of muscle, nerve, and brain also wears out the system unless we give the body an opportunity to recover from it in the appointed manner. From its deprivation many serious diseases result; of which insomnia, apt of itself to cause death, as well as epilepsy, insanity, idiocy, are only a few examples, as well as infectious and contagious diseases, all apt to beget and include brain symptoms. Should any of these results happen matters can only be regulated by mental relaxation, aided by reading, music, change of scene, and society.

But even rest and nightly repose do not wholly suffice for Man's physiological wants. It is also necessary to rest from mental toil and bodily labour every seventh day: that is on the Sabbath, specially made for Man, and for this purpose (Mark ii. 27). This Hebrew word means *rest*; and to this our modern Christian Sunday corresponds. Most civilized nations in modern times take a weekly rest, to recruit from the bodily and mental fatigue of the previous six days. And experience shews that this has several advantages: and is not only mentally, morally, and spiritually beneficial to mankind, doubtless the main object for which it was instituted; but also physiologically good for the body and thus practically advantageous to business; as the refreshed frame returns to the latter with new zest, able to work longer, and imbued with renewed vigour and courage. The weekly rest increases the physical, mental, moral, and spiritual tone: the body being refreshed, the mind cleared, the heart strengthened, and the soul less earth-fettered: so that instead of being impoverished we are actually enriched by newly instilled health, happiness, energy, and hope. On the other hand, the result of a non-acceptance of this weekly boon is exhaustion of body, mind, and soul; and ultimately physical, mental, and spiritual decrepitude or disease. From personal sanitary motives therefore, as well as from the love we bear and obedience we owe to God, the being who initiated the law for our racial benefit, we should keep the fourth commandment strictly, and abstain from all unnecessary work on the Sabbath

day. When nations habitually break this law they, like individuals, not only tempt Him to anger for disobedience of the Divine command; but also court disease. And this is doubtless one and perhaps the main cause of the failing prosperity and waning health of sabbath-breaking countries.

Biblical and Mosaic Notices Regarding Rest and Sleep

The various forms of the body, heart, mind, and soul rest now spoken of are not only very early but also very frequently mentioned in our infallible health-guide book, the Bible; and in strong impressive language: shewing the importance of the subject in Jehovah's eyes, from a sanitary point of view: using that word in its widest sense, as including the spiritual, moral, mental, and physical welfare of mankind.

Man's natural constant and implanted desire for rest and sleep in the work and education of this world, so largely blent with physical bustle and mental worry (Ps. lv. 6), is indicated in the comforting anticipatory promise of the complete "rest" that is to characterize the future state of the obedient and the blessed (Heb. iii. 9); a state that will dispel for ever that never-satisfied and invariable longing which forms one of the most characteristic attributes of the human being, in other words the human soul during its earthly career; and is especially pronounced after the "eyes of the understanding" (Eph. i. 18) have been opened by Divine grace to "spiritually" discern its heavenly aspirations and destiny. Man, like the Creator in whose image he was made, requires rest (Gen. ii. 2; Mark vi. 31). And, that the law is made for the body as well as for the soul, for matter as well as for mind, is shewn by the fact that rest is as necessary for the lower animals as it is for Man himself, their copestone (Ex. xx. 16); and even for the inanimate land (Lev. xxv. 4). The object in enforcing it for Man, beast, and soil alike was to prevent spiritual, mental, corporeal, and physical exhaustion; and permit complete recuperation of their exhausted energy.

The majority of the Bible hints regarding rest speak of its worldly advantages when properly regulated, and the disadvantages of the reverse. But its effects on health are clearly included. Although this is not directly, still it is indirectly, proved by the texts which praise it and shew that it is not merely a pastime or a luxury, but necessary and beneficial for the mind and body as well as for the soul. Rest is one of the rewards promised for faithful service to God (Deut. xxv. 19): this being not only eternal but also temporal, and an integral part of the "peace which passeth understanding" (Phil. iv. 7). Rest is the

gift of love (Ps. cxxvii. 2); and the sure reward of labour (Eccles v. 12). Rest is a beneficial and indeed necessary blessing (Is. xxviii. 12; lvii. 2; Ps. lv. 6; cxxvii. 2; Prov. iii. 29; Eccles v. 17; John xi. 13; xii. 24; 2 John iii. 13). Lack of rest is deemed injudicious (Mat. xiii. 43); and its deprivation deemed disastrous (Prov. iv. 16; Ps. cxxxii. 4; Dan. vi. 18). Rest was enjoined the Hebrews of early times even during harvest, the busiest part of the entire year (Ex. xxxiv. 2): a fact which points out its hygienic importance.

On the other hand over-indulgence in this enticing luxury is blameworthy (Prov. vi. 9-10; Is. lvi. 10). The Bible corresponds with Nature and experience in indicating that night is the best time for sleep (1 Tim. iv. 7). But, for the above-mentioned reason it does not specify the amount required either of this or of ordinary rest, and only indicates that we ought to have enough, though not too much. In short, *moderation* is inculcated in this as with all other necessities, desires, and luxuries. An unconquerable desire for rest usually comes when we are tired. And, as with our appetite for food, so the longing for sleep returns at periodic intervals, when the body and brain require it. There is no necessity for the Bible to enforce this natural law by actual command, seeing that we are more likely to err on the side of somewhat too much, which would do us no harm, than of too little sleep or none at all, both of which would be detrimental to health.

But it is entirely different as regards the seventh day or Sabbatic rest. To most, and especially to business people, the necessity for this is often not so apparent. If the decision is left to the cupidity or thoughtlessness of other individuals, who perchance view the matter solely from a business point of view, we might frequently be compelled to work on every one of the seven days of the week, and thus be kept at unceasing toil. God, however, has wisely and beneficently endeavoured to prevent this by instituting a law, since then one of the great and unbending laws of Nature, which enjoins rest on each seventh day; a commandment evidently meant not only to give opportunity for closer communion with God and soul rest; but also and doubtless largely to refresh the frame by a cessation from physical work, and by thus resting the physical frame, enabling it to return to "the daily round, the common task" of life, whatever that may happen to be, with new zest and renovated strength. The Heaven-appointed aim of this rest is thus in a multiple sense sanitary, and therefore of great sanitary importance. It is healthy, life saving, life-prolonging, physically; and also socially, morally, and spiritually hygienic, and a renovator both of the body, mind, and soul. Sabbath observation and its rest are conducive to morality and to holiness, as well

as to the ampler study and more comprehensive reception of the Maker's words and His works; the noblest enquiry into which any human being can indulge.

Experience proves this by shewing that the body accomplishes more and executes better physical labour; and that the brain also does more and better intellectual work by having a weekly rest to enable them partly to lie fallow and to have that milder beneficial form of work that we term recreation or change; and that neither as individuals, communities, nations, nor as a race, are we made poorer thereby, or suffer any other detriment, but rather the reverse. So that, look at the matter from any standpoint we choose, even a selfish business one, the day of rest, conscientiously kept as such, is not lost or wasted in any sense, but rather the reverse. And to quote Macaulay, a wise student of history, "while industry is suspended, while the exchange is silent, while no smoke ascends from the factory, a process is going on quite as important to the wealth of the nation as any process which is performed on more busy days." And he might have added to the national and individual health and longevity and vitality. Man, the acme of vitalized or animal machines, compared with whom all of the most elaborate of the contrivances of our human Watts and Arkwrights, are contemptible and worthless, is repairing and winding up and recuperating expended tissue, function, and energy, by this periodic weekly rest, so that the guiding entity or soul returns with its aid to his labour on the Monday with clearer intellect, livelier spirits, and renewed corporeal zest and vigour by this Sabbatic vacation.

The Heaven-devised command to work on six days of the week and on the seventh to rest and do no work except matters of necessity and mercy, such as care of the ailing, included both man and beast and not humanity alone. It included our servants, guests, strangers, our ox and our ass, and all of our human domestic aids; so that these should likewise rest and be refreshed (Ex. xxiii. 12; xxxv. 2). Great blessings resulted to the Hebrews of early days from close observance of the Sabbath; and great evils from its non-observance. The same result has been observed in all nations and ages since then; and nowhere more than in Great Britain. The question of Sabbath observance is likely to be a perpetual and frequently recurring one; continually assuming new phases as Man's civilization advances, and his social and physical condition changes. It is still, and probably will long be one of the great unsolved problems of sociology how to spend the day in accordance both with Man's individual sanitary necessities for rest and the observance of God's moral and spiritual law. The problem is necessarily a difficult one: because each nation is

composed of so many individual minds, wills, desires, and opinions; each anxious to have his own way, and thinking that the only right idea. And no doubt the leading thought that causes statesmen and philanthropists to be chary in opening museums, public parks, &c., and fostering open-air enjoyments and out-door recreations; is the difficulty that many of the working classes have in drawing the same line between what is Sabbatically lawful and what is unlawful; and the danger of their *en masse* over-stepping the line and including such recreations as theatre-going, and others which are worse because they pander to our lower nature; among the less dangerous and therefore permissible ones.

Attempts have been made to secularize the Sabbath by proving that this seventh day rest is not necessary or binding in modern days; and is neither a necessary nor a permanent ordinance, but merely an ancient special temporary and educational arrangement for the early Hebrews of the Wanderings. But the Bible itself proves that there was an artificial division of time into weeks long before the Sinaitic law was given at Horeb; and even before the Jewish nation existed (Gen. viii. 10; xxix. 27-28); shewing that this was one of the primitive institutions of the human race. Moreover, all nations, not the Jews only, but others to whom the *law* was not specially delivered; peoples who probably knew little of it and of the Pentateuch; and who might possibly despise them as Israelitish, *e.g.*, the Assyrians, Egyptians, Greeks, Romans, &c., divided their time into periods of seven days; clearly a relic of the Edenic dispensation and of Adamic times. Moreover the terms in which the day is spoken of in the fourth Commandment, thus, "*Remember* the Sabbath day to keep it holy," shews that this was not a new law given the Hebrews and Man for the first time; but merely a revival or rather a renewed inculcation and reiteration of a long-instituted but half-forgotten and oft disobeyed ordinance, doubtless originally given our first parents in the happy, sinless days of Eden. The law forbidding the gathering of manna on the Sabbath, and rendering this practically unnecessary by an anticipatory double provision on the previous day, was moreover given before the Sinaitic promulgation of the ten Commandments and Mosaic Code (Ex. xvi. 5; xxvi. 27; xxxi. 12-13). In pre-Mosaic days, and even during the Egyptian oppression, this beneficent Divine and eminently hygienic command, the fourth of the Decalogue; a law sanitary for the body as well as for the soul, and instituted to aid in preserving the health of Man as an entirety, including his soul, body, mind, and heart, had evidently become a neglected and almost forgotten institution, even by the Hebrews; as it doubtless has often been since both by nations and individuals. For

although Jehovah rested from His active labour in the creation of our completed earth on the seventh day of the week, and may thus be said to have instituted the Sabbath (Gen. ii. 3): and it may be argued that this institution is pre-Mosaic, as old as mankind, and of universal concern and obligation; still it is not till Ex. xvi. 23-29 that we find the first incontrovertible institution of the day, and then among the Israelites. Up to the giving of the law at Sinai, though the day was known, and in some measure observed as a sacred day; still the rule of abstinence from ordinary work was first given then in distinct and unmistakeable language by its Maker (Ex. xv. 26). After being re-enacted and explicitly imposed in the form of the *fourth* Commandment of the Decalogue, the observance of the Sabbath became binding. This ranked the command above an ordinary law, and made it one of the signs of the covenant of that epoch. As such it remained as did the Passover, and formed the most solemn and distinctive feature of early Hebrew religious life. Its neglect or profanation was deemed the chief of national, as it was of individual sins. Its renewed observance was one of the unfailing accompaniments of national as it was also of personal reformation; and a most important part of the many-sided Hebrew education in the Wilderness. So that even before the Decalogue was formally promulgated from Sinai in the presence of the whole congregation, and no doubt as prelude to this enunciation the Israelite was stoned to death for gathering sticks on the Sabbath Day; as a national and personal warning against disobedience of God's laws; a fact which shews that this and doubtless the whole of the ten Commandments of the Decalogue, at least the spirit of them, were both known and followed by the devout from the earliest times; the law written or developed in all godly hearts by the Divine Being whom they worshipped, and who opened their eyes to read and their hearts to follow it.

At a later day the Messiah did not treat the Sabbath and its observance as matters of no account; but spake of them as ordinances meant to be continued (John xx. 19-20). And he specially sanctified it; as also did the Apostles, and likewise the primitive Christians (Acts xx. 7; 1 Cor. xvi. 1-2).

Attempts have been made to modify these views, in order to reconcile conflicting opinions and lead to a larger and freer observance of the day, one in which the social and personal necessities of the labouring classes who form the mass of mankind, and to whom this weekly rest is especially welcome, and who ought to spend the day in the manner most consistent with their duty to God, their fellow creatures, and themselves. Therefore, those who hold such views argue, broad, religious common

sense ought to regard every day as a Sabbath on which to commune and retain fellowship with their Maker. Now, in a sense, it is decidedly true and right that mankind ought to be heavenly-minded and should walk with God, love, and worship Him, not on the Sabbath only but at all times and everywhere (1 Tim. ii. 8); still God's own decision on this subject, as given in the fourth Commandment, ought to be final on the subject, and clearly form our rule of conduct in this matter. The boundless love and knowledge of the Creator knows what best suits mankind, individually, nationally, and racially; and from the beginning made the Sabbath a Divine institution; subsequently re-enacted and emphasized it from Sinai, and later on endorsed it in the Saviour's words and actions and teaching, to be supplanted by its representative, the modern Christian Sunday. Clearly, therefore, we ought to strictly set apart this special day, not only for soul refreshment, but also for physiological and sanitary rest of body and brain. The strict observance of this seventh day as one of rest in its widest sense, is thus a Divine obligation meant for the benefit of the whole Man; that wonderfully composite being of earthly mould but Heavenly destiny; of lofty aspirations and high moral and spiritual aims, but often of weak and imperfect performance. As long as mankind remain in their present sin-tempted and faulty state they must have rest and sleep, for the welfare of the body, mind, morals, and soul. And, for this purpose the Christian Sunday is as much a day of hygienic rest as was the Mosaic Sabbath; and as obligatory as one of God's laws, spiritual, moral, social, and sanitary. As a landmark to be kept, as of old, in commemoration of God's rest from His great creative effort for Man and his worldly abode, the earth (Gen. ii. 2); as a special sign of a covenant with our Maker; and in its modern form of Sunday, of religious significance, as a special memento of Christ's great work of human redemption, it is evidently unwise to disobey and thus practically annul the command by wholly secularizing or treating it as if it were a fiction or a purely ecclesiastical institution (Exod. xxxi. 12-13) devised for clerical purposes.

The religious feeling, for the proper outcome of which the Sabbath was instituted, is not a new sentiment originated and developed in the mind and heart of Man by teaching. Nor is it one that we believe in and follow because it is inherited. But an intuitive, hereditary and congenital belief ingrained in our nature, and as deeply rooted in our latest arrival as it was in Adam and Eve. Nor is it a phenomenon occasionally met with and common in some favoured tribes; but one which is as widespread as the race; and that, although it may change forms and modes of expression, as do the varieties of mankind, does

not die, but is propagated with successive generations. In short, religion is the Heaven-implanted tie that connects Man with his Maker: and the weekly Sabbath the God-ordained bond instituted to meet this, and link Man with religion. Religion is meant to purify, elevate, and brighten the present life, and make it a pleasant prelude and foreshadow of, and not a dismal vestibule to the life which is to come. To neglect the Sabbath or the Sunday is therefore practically to sever our connection with religion; and thereby with our Maker; and to refuse one of his best of boons. How to keep the day is an oft-mooted question, not easily laid down to rule to suit all races and individuals. Some nations and individuals require more spiritualization of the day than others. Nor is it an easy task to point out the opposite extremes to be avoided; to specify accurately the golden mean best suited for races or persons standing on different moral and intellectual planes; or to give precise statements and forms of duty so as to be neither too secular nor too sabbatarian. In forming a decision it must never be forgotten that the Sabbath or the Sunday is not meant for mere animal rest for the body; nor to be a gloomy penitential rest for the soul: so that the opposite extremes must be avoided, that of devoting it solely to sight-seeing, convivialities, travel and like amusements; and of giving it wholly to devotion. The natural, allowable, and safe mean of these two extremes regarding Sabbath observance is; a judicious combination of religious offices, with moderate and just temporal relaxation. We are most likely to ensure a true and lasting renovation of the body and the soul; and restored vitality both of the mind and the frame by not too strictly enforcing pious observances for the soul or too freely indulging in secular relaxation for the body and the mind and heart. Humanity requires change; and even the most devout of men weary of reading pious books and holy meditations. These ought to be alternated with rest and relaxation. Hence it is not easy, but on the contrary very difficult and perhaps impossible in any country, no matter what its creed, and especially as both nations and individuals differ materially in social, mental, moral, and spiritual requirements, to definitely conclude as to personal or public obligations in the matter of Sunday observance, and above all to legislate for the public in a manner consistent with that individual and communal love of freedom everywhere dominant.

The change of day from the Hebrew seventh day of the week or Sabbath to the Christian first day or Sunday, permits of no relaxation in its observation. The main difficulty and question among the masses appears to be not as to the time but as to the manner of its observance. About this there is much difference of opinion. Some keep it very strictly and others

with considerable latitude and freedom; many, especially of the better classes having elastic ideas on the point, especially as they have opportunity to indulge in secular matters and amusements; while doing nothing to make it equally agreeable to their poorer and less fortunate brethren, the working class.

The following facts regarding the Sabbath of the Jews and Gentile Sunday are worthy of remembrance:—

1st. This special day of rest was Divinely instituted (Gen. ii. 2-3; Ex. xx. 8-11; Deut. v. 12.15; Ezek. xx. 12; xliv. 24).

2nd. It was re-established under the Gospel dispensation (Mat. v. 17; xii. 12; Mark ii. 27).

3rd. It was then changed from the seventh to the first day of the week (Gen. ii. 2; Ex. xx. 11; Luke xxiii. 56; John xx. 19; Acts xx. 7; 1 Cor. xvi. 2; Rev. i. 10).

4th. The duties appertaining to the day are duly enjoined by the Holy Scriptures (Lev. xix. 30; xxvi. 2; Ezek. xlvi. 3; Mark vi. 2; Luke iv. 16; Acts xiii. 14, 16, 27, 42, 44; xvii. 2-3).

5th. Works of necessity and mercy alone are to be done on the Sabbath (Mat. xii. 1-3; v. 7, 12, 13; Mark ii. 23-27; iii. 2-4; Luke vi. 9, 13, 15, 16; xiv. 3-5; John v. 8, 10, 18; vii. 22; ix. 14).

6th. Certain blessings are promised those who keep it properly (Is. lvi. 2, 4, 5, 7).

7th. On the other hand, Sabbath desecrators are threatened with punishment (Exod. xxxi. 14-15; xxxv. 2; Numb. xv. 32-36; Jer. xvii. 27; Ezek. xx. 13, 16, 23, 24; xxii. 3-14; xxviii. 31; xxiii. 38-46).

8th. All servile labour was strictly forbidden (Exod. xvi. 23-29; xx. 10-11; xxiii. 12; xxxiv. 21; xxxv. 2-3; Deut. v. 14-15; Jer. xvii. 21-22; Mark xv. 42; xvi. 1-2; John xix. 14, 31, 42).

9th. Its privileges might be taken away (Is. i. 13; Lam. i. 7; ii. 6; Hos. ii. 11; Amos viii. 11).

But in addition to this seventh day's rest the Hebrews were commanded by the Mosaic Law to let the land lie fallow every seventh year (Lev. xxv. 4). This, the last of a week of years, was called the Sabbatic year, and was meant to rest not only the land but also the body and brain of the husbandmen. It was good for the soil, "for then the land shall enjoy her Sabbaths as long as it lieth desolate" (Lev. xxvi. 34-43). This included not only the wheat and barley land but also vineyards and olive groves. These were all to rest and be still and their produce left for the poor, and after them for the beast of the field to eat (Exod. xxiii. 10-11). Curiously enough modern farmers likewise find it profitable to let their fields lie fallow every

seventh year; the yield of the following season being usually materially increased. The Holy Scriptures have thus been for over 3,000 years anticipative and educational in agricultural matters and hygiene. And no doubt if business men, especially those of unusually active nations like England and America, would occasionally let body and brain lie fallow in this manner, they would find it beneficial in more ways than one, and in health as well as in business. The importance of this Israelitish ordinance is forcibly shewn by the later history of the Hebrews. As they forgat God after settling in Canaan, they progressively neglected to keep the Sabbatic year. But the omission was specially punished, and meted out repeatedly during the captivity of the Jews (Lev. xxvi. 34-36; Numb. xliv. 10; 2 Kings vi. 23-29); and they were kept thus until the debt of years was paid up (2 Chron. xxxvi. 21).

Nor was this all; for again the Hebrews were further commanded to give the land an additional rest by letting it lie fallow one year after every forty-ninth. During this, the fiftieth year, otherwise termed the Sabbath of years, Sabbath of the land, or year of Jubilee (Lev. xxv. 10), they neither sowed, reaped, nor gathered any of the fruit which grew. The practical effect of this corresponded to that of the seven years' rest, and not only benefited the agriculturally exhausted land, but also eased the physical toil of the husbandmen, hired servants, sojourning strangers, but also the labouring animals. Doubtless a similar observance might be equally beneficial in modern agriculture.

But in addition to all these the Hebrews had special days of rest connected with their particular mode of worship. For example, at the Feast of Trumpets (Lev. xxiii. 23); at the Feast of Atonement (Lev. xxiii. 30); and at the Feast of Tabernacles (Lev. xxiii. 20). These periodic rests are clearly not binding on us in modern days; as they were mainly ceremonial. At the same time they strengthen what is here upheld and go far to shew that the rest so often mentioned in connection with the Sabbath is for the benefit of the body and brain as well as for the soul, and is physiological and hygienic as well as spiritual.

These Biblical injunctions regarding rest are applicable to and meant for individuals, families, communities, nations, and the entire race. Rest of different kinds was necessary for the temporal welfare of the Israelites; and disastrous if withheld. It was promised them as a reward and a blessing (Deut. xxv. 19; Josh. xxi. 44); and they were deprived of it as one form of punishment (Deut. xxviii. 65-67; Is. lvii. 20). History proves that it is the same in modern times. Working people may be over-driven by being deprived of their necessary rest. Nations which are over busy in commerce, and especially in war, and that never relax their mental and physical efforts, ultimately

suffer for it. So, likewise, families, societies, and communities that turn night into day, and spend the former in revellings instead of repose; especially those who forget the weekly day of rest, are punished with as much certainty as the individual transgressor.

Clearly, therefore, the ancient Scriptures and modern science agree regarding the Hygienic importance of rest, sleep, and Sabbatic relaxation from weekly toil; for the entire entity of Man, his soul, body, heart, and brain; for his spiritual, moral, social, mental, and physiological or hygienic interests. And the Bible has been for centuries pointing out facts concerning these, both directly and inferentially, the truth and great value of which we are only now beginning to fully realize and occasionally dispute about, and not unfrequently still, with all the wilfulness and folly of ignorance and conceit disobey more or less fully. The hygienic importance of and necessity for the rest of night and the Sabbatic one of the inherent necessity for a weekly respite from toil, was settled by the Divinity in His Holy Scriptures over three thousand years ago. Is it not presumptuous, daring, and unwise in the creature to dispute this or any other point with his Creator; and dictate regarding matters of which the framer and preserver of our bodies is clearly and by far the best of all judges, because He is supreme in wisdom and infallible in council.

These various Mosaic laws regarding rest were not formulated and divulged by Jehovah solely to teach the Hebrews of the Wanderings the great lesson of perfect obedience to Him, a lesson which that unruly people greatly required, and one which has to be inculcated on all mankind both individually and collectively as an initial factor in their duty as created beings to their Creator: but they had an all-important secondary object, namely, to teach them the chief fundamental items of hygiene, and to instil the necessity for strict obedience to the laws of sanitation on this important point, the imperative necessity for periodic rest of soul, body, mind, and heart, as a prime essential of earthly health, happiness, and longevity; and through the Hebrews to teach us and the world likewise.

CHAPTER VII

CLEANLINESS

"Thou shalt be clean" (Numb. xxxi. 24; Ez xxxvi. 25; Amos iv. 6).

In its ordinary popular sense this term refers to cleanliness of the outer surface of the body only. That the extensive surface of the human skin is one of the most important organs in the frame, and its functions equally so, is now fully recognised in modern physiology. And, as the chief outcome of this belief, if there be any part of the body of which hygiene takes special care, it is the cutaneous surface. Biblical hygiene gives the cleanliness of the outer surface equal if not more importance. We are wise, therefore, when we follow both our natural instincts and the Holy Scriptures, that is Divine teaching, and give the skin and its functions constant care in our daily life: because much discomfort and disease enters by this channel; much of which might and ought to be avoided.

Cleanliness being now recognised and accepted both from a Biblical and a secular point of view as one of the most important factors in human hygiene, and as a potent help and urgent necessity for comfort, health, life, and longevity; its value is daily becoming more fully seen not only in the hygiene of health but also in that of disease. This marked advance and enlightenment is mainly due to the modern discovery by scientists of the world of morbific microscopic parasitic life, invisible to our unaided eyes, but in the midst of which we live; which are consequently over, around, under, and even within our very bodies; from which there are few spots on earth where we can altogether get free or remain wholly clean and uncontaminated thereby; but which most abound, like all other living things nearest the earth's surface. These come in contact with and cling to, 1st, our outer surface, aided in this by the clothing and the perspiration; and not only help, like inert dust, to soil it, but penetrate it and cause disease; or get thence into the blood-vessels and current, and there originate other dire ailments. Or 2nd, with the inspired air they get into our lungs and there beget disease (phthisis); or into the blood and generate others (the contagia); or 3rd, they find entrance into the stomach by the food or drink and thus originate other ailments (*e.g.*, cholera, yellow

fever, plague, &c.); and thus may in various ways cause much disease and mortality: their minuteness, rapid increase and parasitic poison-producing properties constituting their chief danger. The cleaner, therefore, we are, other things being equal, so much the more comfortable and healthy are we likely to be. Indeed, it may be averred that it is impossible for human beings to be too cleanly or to live too purely; taking these terms not only in their physical but in their widest sense.

From Klein's statistics we may glean some faint idea of the foes against which we have to contend in these bacteria by their rapid multiplication. An English postage stamp, seven-eighths of an inch long and six-eighths of an inch wide, would carry five hundred millions (500,000,000) of the typhoid bacillus; and if the layer was the tenth part of an inch deep there would be two thousand millions upon it (2,000,000,000). Water that was to the eye perfectly clear and pure would in a few days teem with bacteria. If fifteen drops of bacteria-laden fluid were let fall into a cup of broth they would produce eighty millions (80,000,000) of bacteria in twenty-four hours. There is a certain epidemic to which fowls are subject; and the blood of a fowl so diseased teemed with that special bacterium, so that every drop would produce one million more (1,000,000). If the fiftieth part of a drop of the blood was transferred to a rabbit it would be dead in twenty hours, and the blood of the rabbit would contain twelve hundred millions (1,200,000,000) of bacteria. Bacteriologists can now not only cultivate bacteria but differentiate the various species characteristic of certain diseases. They can also weigh them. Thus in one gramme weight (15·434 grains) of the bacillus typho-abdominalis there were one hundred and twenty-two thousand millions (122,000,000,000). These cause some of our most formidable diseases, such as diphtheria, influenza, consumption, typhoid, typhus, erysipelas, scarlatina, plague, leprosy.

To effect satisfactory cleanliness, even in a moderate degree, it is therefore clearly necessary to be constantly on the alert, as there are so many agencies in and about us apt to soil and disease us. As an important part of the world in which we live we are being constantly contaminated by it, its productions, our fellow creatures, our work, and even the food, drink, and air we consume. These, moreover, we contaminate in return in various ways and degrees; a result not only unpleasant but unsanitary and disease-inducing. Hence the full and careful study of these soiling and unsanitary factors is imperative hygienically in order to know how to prevent or remedy these noxious influences; or to lessen or annul their evil results; and first of all necessary to know of what they consist and how they originate. Many people are unaware of the chief sources of

contamination; the frequent extent of this; and the different forms of morbific injury it is apt to inflict. One result of the study will be to shew that a necessity exists for even greater cleanliness in our ordinary life than is generally practised; and a desire to know how this is best accomplished.

The following are the chief sources of contamination:—

1. The body we are so anxious for motives of comfort and health to keep clean is prone to sully itself in various ways, both externally and within, as will be easily understood. For example, by our many different secretions and excretions; those of the skin and of the interior of the body. Even the most cleanly are thus being constantly contaminated in various degrees and ways. Again, the different tissues and parts are also being constantly wasted, expended, and thrown off and out of the system by the different excreting organs, kidneys, liver, bowels, lungs, skin, &c. By the latter the body is apt to be defiled on its surface, where the perspiratory and fatty excretions are apt to accumulate, with small particles of cuticle, constantly being thrown off.
2. The body is apt to be still further contaminated outwardly by our clothing, soiled by our occupations, dust, and many other causes, unless kept scrupulously clean.
3. The same may be said of our bed and bedding; apt to be soiled also by our bodies, perspiration, &c.
4. Culinary and kitchen utensils are apt to be, and to make us and all we eat and drink impure, unless kept very clean. Dust is apt to settle in debris of food, and microbes to multiply therein to infect us.
5. Furniture becomes dusty and dirty, soiled and dangerous to health and life, unless carefully cleaned and aired.
6. The interior of our houses, floors, walls, pantries, cupboards, cellars, attics, rooms, and bedrooms, are all apt to become dusty, dirty, mouldy, stuffy, and in various ways impure, unless carefully swept, cleaned, and ventilated.
7. Public halls, churches, hospitals, sick rooms, are all apt to become unusually impure and apt to foster germ-breeding diseases: and thus should have special attention to cleanliness.
8. Lavatories, out-houses, dust heaps, &c., require especial supervision to prevent sanitary danger to the inmates of the main building.
9. The water supply may also be impure or scanty or both; and thus detrimental to comfort and a source of danger to health and life. The supply should be pure and

sufficiently abundant for drink, cooking, washing, baths, sewerage, &c. Many diseases originate in and by the gases, odours, and germs of scanty and especially impure water. The "filth" diseases are a numerous and potent class, of which typhoid, diphtheria, cholera, plague, may be quoted as examples.

10. The atmosphere of localities or houses and of rooms may become impure by overcrowding and contamination, disease inducing, and therefore dangerous to health and life of their occupants, if the ventilation is not sufficient to carry off the morbific emanations; microbic dust, noxious vapours and gases, added to the air from without or within.

11. Impurities may also be carried into us *by* our food and beverages, to cause dire havoc.

These facts combine to show in how many ways the human body may be contaminated from without and from within; and that both in civilized and uncivilized life, the frame is being constantly soiled and made uncomfortable and often diseased, notwithstanding even our best care, by its environment, and the solids, liquids, and aerial or aqueous dust, vapours, and gases amid which we live, and from which we cannot altogether get free. The study, moreover, extends the subject of surface cleanliness to physical cleanliness of the interior of the body and its many intricate passages and parts: all lying in the wide domain of corporeal hygiene. Indeed it is more important to keep the interior of the body clean than the exterior; because there the inlets for preventible disease are the more numerous.

The chief methods of lessening these impurities and sources of body contamination, which cannot be altogether prevented even with the greatest care and skill; consist in purifying and cleansing our bodies, houses, and their contents, and all in the vicinity, including the atmosphere. For this the principal agents are:—

a By ventilation, giving a plentiful supply and renewal of pure air from without. (See Chap. 4, Part 2, Air).

b By a plentiful supply of pure water for drinking, cooking, washing, baths, sewerage, &c. (See Chap. 3, Part 2, Drink.)

c By frequent dusting, sweeping, washing, and cleansing in different forms. (See Chap. 16, Part 2, Tabernacle.)

d By the careful and judicious use of chemicals for disinfection; to (see Chap. 16, Part 2, Tabernacle) render the air, water, &c., fit for humanity and health.

These considerations will render it sufficiently apparent how important these two abundantly supplied agents, air and water, Nature's purifiers, are for purposes of body cleansing. The

question of air is elsewhere considered (Air, Part 2, Chap. 4). Here we have mainly to do with water as a cleansing agent for the surface of the body, that part most apt to be contaminated from without. The importance incumbent on all, old and young, rich and poor alike, and especially the working classes, necessarily most subject to soiling, for cleansing the skin frequently by at least daily ablution of the entire surface, and the most exposed surfaces, the face, neck, hands, and feet oftener if necessary. Soap is cheap and water plentiful. It is therefore most important that all classes should have a plentiful supply of this, the most abundant and best of all cleansing materials, namely, pure water. Sometimes this is easily attainable by the individual or household. In communities it often is not; and this carries the subject from the domain of personal to that of communal, public, and even national hygiene, where companies, councils, or the State have to step in and help the private citizen by furnishing the supply.

The popular maxim that "cleanliness is next to godliness" is a public recognition of a belief in this great truth, that this factor is one of the most important elements in the natural laws of health. Nay, experience proves that cleanliness is often the gateway to godliness. Because if we can persuade the unwashed, ignorant, poor, erring, and even the criminal to follow this simple sanitary measure, it often proves to be the thin end of the wedge that paves the way to other deeper and more important bodily, mental, moral, social, and even spiritual reforms. Nothing is more evident to the practical philanthropist and hygeist than the close connection that exists between unhygienic habits and unsanitary surroundings on the one hand, and crime and vice on the other. Working people obviously require more thorough and frequent ablution than those who lead an idle life, for an obvious reason. So the necessity for frequent ablution is likewise greater in warm than in cold and temperate seasons and climates; because the skin acts more freely and so contaminates oftener: and there the cold salt or fresh water bath becomes a positive luxury; the feet obviously requiring special care and frequent ablution. For ordinary purposes in temperate climates like ours, the cold bath (45° to 50° Fah.), or the temperate (55° to 65° Fah.), and occasionally for more thorough cleansing, for example once a week or fortnight the tepid bath (over 86° Fah.); or the warm (over 95° Fah.); the hot (110° to 130° Fah.); and the vapour bath (99° to 130° and even 170° Fah.) are sufficient. The Turkish or Russian baths have their advantages. These not only remove the perspiration and effete skin; but stimulate, promote the cutaneous functions, and also give it and the entire body tone and health. Cold bathing has its hygienic advantages. The

sharp transient shock acts as a bracing general *stimulant*; as a *tonic* by stimulating the general circulation; and acclimatizes by accustoming the body to sudden changes of temperature such as those which often initiate disease, especially colds and inflammations. In summer and on alternate days in winter, indoor, a bath of fresh sea, lake, or river water may be safely indulged in by the healthy. Too frequently repeated *warm* bathing is depressing. But in regard to hot and cold bathing alike due regard must be paid to age, constitution, health, and vascular tone. A little common sense will soon detect when either variety agrees or disagrees, and should be continued or left off.

As it is scarcely possible from a hygienic point of view for any person to be anywhere or at any time too cleanly in their person; the necessity must be equally apparent for additionally aiding this surface purification by frequent changes of clothing, especially the inner garments, really worn as much for cleanliness as for warmth; and also for supplementing both by thorough cleanliness of bedding, furniture, dwellings, workshops, and any other place or thing by which we may be contaminated.

The opposite practice, want of or minimized cleanliness soon becomes evident, and even obnoxious to others; and even to ourselves, our own eyes and nose. And what is worse, the skin gets coated; perspiration is suppressed or lessened by clogged pores, and disease thereby courted or induced: its important functions both as a breathing and an excreting organ being interfered with. Noxious matters, which ought to be thrown out, are thereby retained in the blood and body, and thus various diseases, not only of the skin itself but of other parts, particularly the glands, which have then to come to the aid of the burdened cutaneous surface in performing its function, and may become overtaxed in their effort by excess of work, are apt to ensue. When we recollect that the skin helps the liver and the lungs to excrete carbon and vice versa; that it also aids the kidneys and lungs to throw off water; and that it likewise assists the intestines to excrete salts from the system; it will be readily understood why it happens that by coating the skin, say with varnish, so thickly as to stop its function, the person would soon die; an experiment which has been tried on the lower animals. This is exactly what we do in another but minor manner when we neglect to bathe or wash, and thus permit a coating of effete skin and dirt to collect and adhere on the surface of that most important health-preserving organ, the skin; and the result is equally detrimental to human health and life. So that the axiom may be laid down that the cleaner the human skin, so much the more healthy, clear-brained, and longer lived are we likely to become, both individually and collectively.

Modern hygiene, among civilized nations at least, inculcates the full extension and application to cleanliness of the whole human entity; and not to physical purity only, but to cleanliness of the higher and intangible nature; of the mind, morals, social life, heart, and soul. The Egyptians, especially their priests, the Greeks, Romans, and other ancient peoples, were largely devoted to physical cleanliness; but this was entirely disassociated from the latter; and clean bodies too often enshrined impure and immoral minds, hearts, and souls. Our modern secular ideas regarding the higher hygiene are unquestionably Bible derived; and mainly due to the Divine teaching written and inculcated by Moses many centuries ago: and will be specially spoken of under the heads of mental, moral, and spiritual hygiene (Part 2, Chap. 12, 13, 14).

Under the heading of "Drink" (Part 2, Chap. 3), the amount of water required for drinking, body cleanliness, baths, washing, house cleaning, and domestic sewerage has been given at from four gallons per head per day up to twelve gallons. A still safer estimate, if we include frequent baths and perfect cleanliness, would be sixteen gallons. With our modern engineering this is a comparatively easy feat to accomplish. The additional allowance for water-closets and refuse removal should be six gallons; and for waste three gallons more. But even this total of twenty-five gallons must be greatly increased if public baths are included. In ancient communities, as now, individual cleanliness was made a matter of public importance. The Romans, the great sanitary engineers of the middle ages, spared no pains, and were daunted by no obstacles to secure pure water sources and an ample supply for their city baths, irrespective of distance, irregularity of country to be traversed, hills pierced, or valleys crossed. They established baths on a scale wholly unknown to us. At one period no less than nine hundred existed in Rome; all magnificent in proportions and fittings. Those of Caracalla (3rd Century early) on the Avertine Mount were one mile in circumference, open to all citizens at stated hours; having sixteen hundred marble seats. Diocletians' baths had three thousand marble seats. Modern public baths can well do without pomp and luxury; but a perpetual and full stream of pure fresh water is indispensable. That the meanest Roman could have a bath such as a king might envy for an *As*, or about half a farthing, is a fact worth remembering and imitating. The baths of Rome, the largest the world has ever seen, required three hundred gallons of water per head daily; that is nine times more than each inhabitant of modern London. At the same time, though this contributed to Roman cleanliness, and therefore to health, it must be conceded that this Roman habit arose more from luxury than from a knowledge of or

belief in personal or public hygiene. The luxurious Romans had not only cold but hot baths. The hot baths of Tiberias or more strictly of Emmaus near it, and of Callirrhoe, near the Eastern shore of the Dead Sea, were much resorted to. In this respect of popular baths and frequent bathing by all classes, the customs of ancient Greece and Egypt resembled those of Rome; but more from motives of luxury than for hygiene.

In warm, and especially in hot seasons, regions, and climates, the supply of water per head daily for bathing, washing, &c., ought to raise the quantity required to thirty gallons among ourselves. Moreover, sick people and hospitals necessarily require a larger amount than healthy persons and private dwellings. The following table will be hygienically instructive as shewing how far short the supply of modern cities is to the no doubt extravagant and wasteful expenditure of Rome: and also as a sanitary index worthy of note, the comparatively large supply of some of the leading cities of the United States.

TABLE X

Water Supply

European Cities.	Daily Gallons per head.	American Cities.	Daily Gallons per head.	American Cities.	Daily Gallons per head.
Dublin	60	New York	95	Philadelphia	56
Glasgow	52	Chicago	80	Cincinnati	53
Paris	38	Hartford	80	Baltimore	50
Edinburgh	35	Reading	75	San Francisco	45
London	33	Albany	75	Lowell	44
Liverpool	30	Buffalo	63	Cleveland	43
Manchester	21	Brooklyn	60	Providence	30
Sheffield	20	St. Louis	60	Milwaukee	25
		Boston	60		

The following total water supply of London shews how materially faster it is increasing than the population: that is the supply is so much better now than it was fifty years ago:—

Water Supply of London

1836—36 million gallons daily
1845—45 „ „
1858—75 „ „
1886—180 „ „

While private cleanliness conduces largely and perhaps more than most other hygienic factors to health and happiness and longevity; so does public cleanliness to the salubrity and welfare of communities and nations. With a plentiful supply of good water such as this in villages towns and cities the public, even the crowded poor, have no excuse for lack of cleanliness of their person, clothing, houses, &c.; no reason for impure unflushed sewers; or for dirty streets. While their individual and general health would be materially improved; disease would be warded off or lessened; and mortality among young, old, and especially infants, greatly reduced. Cleanliness, and therefore the blessings and advantages to vigour and viability that follow its pursuit are clearly to a large extent in our own hands; and those of our municipal and political leaders, and well worth aiming at. Should not factories, workshops, &c., have each their own bath-rooms for workmen, who often have neither time nor energy after long hours and heavy work for resorting to public institutions?

Pre-Mosaic and Mosaic Cleanliness

Although the Sinaitic Code is the great focus and the Wanderings the chief period in which allusions to and inculcations regarding this great factor in hygienics and in Hebraic ritualism is spoken of; cleanliness is markedly alluded to in far earlier Bible times than that of Moses. Thus Noah took into the Ark of every "clean" beast for preservation from the flood (Gen. vii.), seven pairs; these were the sacrificial, edible, and domestic animals useful to man, which it was necessary to propagate quickly. Of the "unclean" varieties he only took a pair of each; these being non-sacrificial, non-edible, and mostly wild animals. Creeping things were not excluded. The terms in which God's command to Noah was made shews that the Patriarch knew of this division of animals into "clean" and "unclean," doubtless made in outline in early Adamic days, when animal sacrifice was begun: a clear forecast of the subsequently codified Sinaitic Law for the Hebrews. Job, written in Abrahamic days, or as some think by Moses, shews the importance of cleanliness "if I make my hands never so clean" (Job ix. 30); "he that hath clean hands shall be stronger" (Job xvii. 9). So also in Job we find an important fact in Nature's hygienics of the atmosphere, "but the wind cleanseth them" (Job xxxvii. 21), by dispersion and dilution and constant motion; even as the tides in the ocean which purify its waters. The prevalent and hygienically necessary washing of feet in warm Eastern countries is spoken of when Abraham enter-

tained the Angels in Mamre and offered the first attention usually given to persons travelling bare-footed or with open sandals (Gen. xviii. 4). So with the two Angels which appeared to Lot at Sodom (Gen. xix. 2). To Laban, to Abraham's servant (Gen. xxiv. 32-33). So with the sons of Jacob when taken into Joseph's Egyptian house (Gen. xliii. 24). Jacob said to his household, be clean and change your garments; personal cleanliness being then, at least among God-fearing people, as now, symbolic of moral and spiritual purity as well as hygienic bodily.

As a rule we may judge of the importance of any subject, sanitary or otherwise in the eyes of the Supreme by the frequency and force with which it is alluded to in Holy Scripture. Viewed thus, cleanliness was not only a great but also wide theme: and its prominence in Jehovistic eyes will become evident: inasmuch as the Bible throughout, not only its Mosaic section, but that of the Christian dispensation, often speaks of the necessity both for personal and public cleanliness. Moreover, it carries the idea of cleanliness much further than we do in our modern secular systems, by extending the sanitary, physical, or body factor to the entire entity of Man; and laying great stress not only on having a clean and pure physical body (Is. i. 16); but includes that of the hands (Job ix. 30; xvii. 9; Ps. xxiv. 4); of the garments (Gen. xxxv. 2; Rev. xix. 8-14); houses and entire human environment: but it also insists on Man having a clean soul and heart and being spiritually pure (Ps. li. 10; Prov. xx. 9); a clean mind and conscience, that is in being morally and socially pure (Job xiii. 10; xi. 17; xv. 3; xxxiii. 9; Lev. xvi. 30; Mat. ii.; James iv. 8; 2 Cor. vii. 1). It thus inculcates and insists on cleanliness of Man *as a whole*; and points out that this is one of the chief themes and teachings of the Holy Scriptures throughout; the regeneration of Man; cleanliness of not one alone, not his frame only, but all his many different parts, functions, and faculties; of body, heart, mind, morals, and soul: purity in all he thinks, does, says, touches, looks at, or longs for: in all with which he has to do, in eating, drinking, breathing; in every pursuit, amusement, work, and even devotion. This indicates that cleanliness, typical hygienic and both, interpenetrates the entire fabric and life of Man; and that, as will presently appear, to an extent and with a minuteness and attention to apparent trifles, which to many, except perhaps to medical and clerical eyes, may appear ludicrous and unnecessary. Hence it is why Jehovah attempted to teach the Hebrews of the Exodus by His hygienic code, cleanliness, more than almost anything else. It is the foundation stone and basis of all hygiene, both of the lower or physical and of the higher or psychical life. In carrying this teaching and practice out they were ordered by law to be scrupulously careful in everything,

at all times and on all occasions; in all they did, touched, read, looked at, thought of, or spoke about. They had to be more careful in moral, social, mental, and, above all, spiritual things than physical matters. Cleanliness is the great hygienic theme of the Pentateuch and indeed of the Holy Scriptures throughout. Purity was deeply inculcated in the Hebrew Ritual and Tabernacle service throughout, even more than in physical, personal, and home-life generally. Thus they had to provide *pure* oil for the lamps of the Tabernacle (Ex. xxvii. 20; Lev. xxiv 2); the golden candlestick had to be *pure* (Ex. xxxi. 8; xxxix. 37; Lev. xxiv. 4); the blood of the grape offered in sacrifice had to be *pure* (Deut. xxxii. 14). So with the camp and Tabernacle (Part 2, Chap. 16). Jehovah requires not only that the worshippers' heart and soul, but all he offers and worships with should be clean and pure and unsoiled. It thus appears that most of our modern ideas regarding physical cleanliness were anticipated by the Sinaitic hygiene of over 3,000 years ago: and more of still greater importance regarding the higher human hygiene was inculcated than humanity, even intellectual nations, has yet been fully enlightened regarding or been educated up to by their own secular efforts.

The reason of all this is obvious. Jehovah desired to restore Man somewhat to his pristine Edenic condition; and make him once more resemble himself in some measure, at least in proclivity towards purity. God, who is a spirit (John iv. 24), speaking by His Apostle, clearly did not allude to *physical* purity when he said "everyone that hath this hope purifieth himself even as he is pure" (1 John iii. 3): nor does the command appeal to Man's body but to his higher spiritual nature, the soul. The God of purity, whose pure eye cannot look upon iniquity, legislating from His pure Heavenly abode and environment desired, as he still desires, His human offspring to be pure and clean in all matters, and informs him how to accomplish this by making ultra-cleanliness in all things, the great and ever-recurring Scriptural hygienic watchword, not only in the Mosaic but in the Christian dispensation and all future time; cleanliness of the spiritual, moral, social, mental, and physical life of Man.

In this as in all other Biblical sanitary matters, the rules and hints of Moses again stand prominently conspicuous in the foreground. Whole chapters in Numbers, Leviticus, and Deuteronomy are devoted to the subject of cleanliness of the person, clothing, tents, tabernacle, and camp (Chap. 17, Part 2). These laws, not only the entire congregation, but also their leaders, and even the High Priest, Priests, and Levites were bound to obey. Jehovah's hygienic system, divulged through Moses, is no petty half-formed compendium; but has the rare

merit of making broad generalizations, and of always going to the root of the matter. Nor does He fail or fall short in speaking and legislating regarding this all-important theme, cleanliness. There is no trifling with side issues, petty and immaterial. And His determined inculcation of the great import of cleanliness extends even to the minutest detail, and not as regards one but in all things; not only in physical purity of body, meant in the Mosaic law to typify cleanliness of Man's other entities, functions, and parts, the mind, morals, heart, and soul, all and their purity too, as real as our corporeal parts, functions, and cleanliness, although undemonstrable by our physical senses, because intangible, and also far more important than these. These Mosaic inculcations on the subject of cleanliness, laid down thirty centuries ago and long before the dawn of medical secular history begins, look as if they were the work of but yet clearly considerably in advance of some modern medical master-mind, bent on the one hand in combating disease and on the other in preventing it. In the face of modern research can we for a moment doubt that these were, not one only, but both, His ulterior objects? Limiting ourselves meanwhile to physical cleanliness in its medical aspects, it clearly requires a Divine all-knowing, over-shadowing mind, such as that of the Divinity, and that also but in a far minor manner of His pupil Moses, familiar with the causes of disease; to perceive how important cleanliness is, both for comfort, the preservation of health and life, and the cure of disease, to plan and legislate accordingly; and to carry the resulting laws into successful effect. Certainly one-half and probably two-thirds of the disease from which mankind suffers would be altogether prevented if we could keep our bodies perfectly clean and free from contamination by making the air we breathe, water we drink, and food we eat, and all we come in contact with chemically and physically pure and clean. So in sickness, how much faster invalids would recover if those elements were admitted to the sick room as pure as we would desire them to be. How much of the physician and the surgeon's skill is employed solely with a view to effect this health-protecting and health-restoring economy! How important and widespread are the many issues dependent thereon; namely restored health and prolonged lives, if successful in our efforts; or aggravated, uncontrolled disease, and perchance death if we fail. Jehovah evidently had these facts in view in his sanitary enunciations to Moses and the Hebrews regarding cleanliness. Moses could know nothing about practical bacteriology. The irritating, disease-inducing and disease-aggravating microbe-laden dust which everywhere exists, especially in the dense lowest stratum of our atmosphere, as well as in water and in the soil, no doubt existed as densely then as now.

But Moses could no more resolve this dust without a microscope than he could an astronomic Nebula without a telescope; both instruments of modern invention. Still, can we doubt that he had sufficient professional acumen to realize that such a world of bacteric life might and did actually exist, although he could not verify their presence: or that he had either an intuitive or more likely a revealed knowledge of this double source of infection, and that the scrupulous cleanliness inculcated by Jehovah in his Sinaitic laws was one of His main methods of meeting and modifying this. Even now, chemists have no doubt of the existence of physical atoms; and physiologists do not question the existence of ultimate biological or living ones, although unable to isolate and demonstrate either. Putting Moses aside as merely the subordinate, we have only to deal with the Divine Hygeist, Jehovah; familiar with the minute vegetable forms which He Himself devised; with their disease originating rôle in Nature assigned them by Him; acquainted with the part they play in accumulated dust and in the hygienic dangers accompanying lack of cleanliness and its laws. He also knew well how much scrupulous physical cleanliness would effect in lessening their morbific influence and opposing their inroads. For just as with other forms of the higher cleanliness, moral, social, and spiritual, it is the beginnings and first initial or baby stage and effects of the first few germs which ought to be our prior and chief aim in medically opposing these dangerous parasites; and better still, if we should succeed by excessive cleanliness to keep them out of the human system altogether by skilful hygienic methods. Jehovah likewise knew well the hygienic forces he had made to oppose or lessen these unsanitary and morbific influences; how to inculcate and enforce these on the human race; and so legislated accordingly. Jehovah knew at Sinai what Man has only recently discovered; namely, that it is not impure air rendered obnoxious and malific by morbific gases and vapours, or by mutable and unstable chemical compounds; but far oftener single-celled but yet infinitely small living vegetable organisms, either circular, oval, or rod-shaped, which cause so many of our direst diseases:—

1st. By their exceedingly rapid generation. Ehrenberg found that no fewer than 268 millions of the microscopic paramecium might be produced in a month by repeated sub-divisions, the usual mode in which these infusoria propagate. Bacteria increase still more rapidly in the human blood or body as they also do in water, their favourite breeding ground, and the chief medium for the bacteric poisons or germs of dysentery, diphtheria, scarlatina, sore throat, erysipelas, typhoid, and cholera, to gain entrance into the body. Samples

of water in which only a few could be seen in from 40 to 60 hours will contain something like $2\frac{1}{2}$ millions per cubic centimetre. Warmth favours their development; so that at the end of two days Cohn tells us a bacterium will have multiplied to the number of 281,500 millions. After a week the number can only be expressed by figures of 51 places. Cholera germs must multiply still more rapidly, as they often kill in six hours. Again, if the space which is occupied by the seas of the world, that is about two-thirds of the terrestrial surface, say with a mean depth of a mile, the collective contents of which would be 929 millions of cubic miles; by continued multiplication the bacteria from one germ would in less than five days fill the whole of the seas completely; their number being expressed by figures of 37 places. At the same time millions of microbes might swim through the eye of a needle. Bacteria are foreign to the healthy blood and tissues both of Man and the lower animals. Whereas in air and earth they likewise abound especially near where these meet at the earth's surface, Man's usual habitat. Their infinitesimal size may be gathered from the fact that 15,625,000 of the comma bacillus or Asiatic cholera germ may be contained closely packed in a single cubic inch of space. As many as from 2,000 to 180,000 per cubic centimetre of water have been counted.

2nd. Their incredible numbers. Union in morbific action is strength.

3rd. They starve the tissues, fluids, and organs of the body on which they feed.

4th. They generate debris and poisons, which act toxicologically on Man.

Even if these ultimate facts and reasons were not divulged to Moses he was at least enlightened and indoctrinated by the Supreme Hygeist with a perfect knowledge of, so as to be able to fully recognise and practically act on the great importance of this factor, cleanliness, as one of the chief elements which affect health beneficially, and uncleanness as that which acts in the opposite way. Thus the hygienic rules of the Pentateuch, practical and theoretical, dictated by Jehovah Himself, clearly anticipate modern microscopic and sanitarial knowledge by centuries.

The Mosaic or Sinaitic laws of hygiene inculcated excessive and all-pervading cleanliness. Indeed cleanliness is the chief theme and watchword of that wonderfully complex, comprehensive, far-reaching, and searching code; a code that included

and invaded even the inner hidden or private life; so minute and perfect was the purity which Jehovah inculcated for Man, in body, soul, mind, morals, and social life. These laws were imperative, and obligatory, on the High Priest, Priests and Levites, as well as on the laity. To disobey the finding of the judge as regards punishment in the hygienic as well as in the sacrificial, legal, and other parts of the law was to court death. Hence minute rules are found in the Pentateuch, to be read and taught the Hebrews, inculcative of personal, public, and priestly cleanliness: rules so many in number and so complex in nature and bearing that it is no easy task to systematize them. And it must have given the Priests, who had the first exposition of the law, no small trouble to study and expound them aright; all untaught as they were in hygienic medical matters, save perhaps by Moses, whose spare time for this, amid the multifarious duties of his leadership, was necessarily limited. Infringement of any of these laws of "cleanliness," whether on the part of persons, the public, or the priest, invariably caused "uncleanness, pollution, or defilement." This necessitated "purification." Moreover "uncleanness" was of several degrees; each of which necessitated one of several different grades of purification. Thus the:—

1st. or minor form of pollution was that infringement by contact, which caused defilement "until even" (Lev. xv. 5), and was removed by bathing the body and then washing the clothes on the day on which the uncleanness was contracted (Lev. vi. 16-17). Probably the segregation for the minor pollution of one day only did not necessitate putting forth out of the camp; as the danger was not communicable or propagatable, and hence only required home or tent isolation. For example, after contact with dead animals; as by touching or carrying the carcase of an unclean animal, or a clean one which had died of itself (Lev. xi. 25-40). Contact alone with ceremonially "unclean" persons, or even with clothes or furniture they had used, also caused minor uncleanness, which was absorbed by ablution on the day of infection (Lev. xv. 5-11); in one particular case after seven days (Lev. xv. 24).

2nd. A major, graver, and more severe penalty for "uncleanness" or pollution was that imposed on the unclean person or thing itself for seven days; and was only removed by the "water of separation." This was connected with human death, the penalty of sin, and in the highest degree contaminating: and required isolation out of the camp. For example, defilement from a human corpse or grave (Numb. xix. 16): kill-

ing a man in war (Numb. xxxi. 19); leprosy, and male or female "issue" (Lev. xv. 25).

3rd. This grade of "uncleanness" was that which arose either from morbid states of body, such as leprosy, which, if incurable, made it last for life: or for the puerperal or womanly periodic conditions and so forth, when it ended with or soon after these.

4th. Again the major pollution of the "issue" communicated by contact not the major but the minor pollution only (Lev. xv. 5-11). Again, a closely corresponding act merited different grades of purification: thus touching a dead animal entailed uncleanness till even, and washing of clothes; whereas touching a human corpse required seven days isolation out of the camp, and purification with the water of separation.

5th. According to the Talmud there are six grades of uncleanness that may spring for each to form distinct new centres of evil: thus—

1. The fully infected and infectious or unclean primary cause, spring or source of pollution to all it touches or that touches it, which were 11 in number. (See Table.)
2. The first person or thing infected.
3. The second do. do.
4. The third do. do.
5. The fourth do. do.
6. The fifth do. do.

All this is evidently typical and spiritually educational; but also clearly sanitary as preventive or diminuent of infectious and contagious germs and diseases. As each fresh contagion occurred the law ordained a mitigation of the penalty. Thus if a dead reptile (an unclean beast) fell into a vessel with water it polluted the water, and the water polluted the vessel; which remained polluted after the water was poured away, and the vessel had still to be cleaned. If, however, the reptile fell into running water, or into a large collection of water, neither the running stream nor stagnant fluid were polluted. This indicated the reducing infective power of dilution and dispersion: a very noteworthy and important hygienic fact, first divulged in the Sinaitic code; but now fully recognised in modern medicine, especially in the prevention of contagious and infectious diseases: a medical axiom which might have long since been acted on had its practical medical bearings and worth been recognised. This clearly proves that this law of a gradually reducing danger of infection by contact and its penalties were not only typical but also meant by the All-seeing and Prescient in medical tuition to be abundantly preventive and hygienic.

The virulence of small-pox is modified and lessened in and by the calf; and as calf-lymph thus rendered bearable by infancy and more or less protective against the original major disease. So in hydrophobia and other contagia and their remedies, and in serums and their therapeutics.

Hebrew defilement or uncleanness, according to the Sinaitic law, incurred and necessitated various penalties to rehabilitate the individual and recover his cleanness. Thus—

1. Single or repeated washings of the person, clothing, utensils, &c., by water, by way of ablution, or aspersion in cases of mild uncleanness; as
   a of the person (Lev. xv. 18; 2 Sam. xi. 4).
   b or of the garments (Lev. xi. 25-40).
   c or of both person and clothing (Lev. vi. 16-17).
   The bath was a prescribed part of the Jewish ritual of major purifications, as in cases of accidental leprosy or ordinary uncleanness (Lev. xv. 16-28; xxii. 6; Numb. xix. 7-19; 2 Sam. xi. 2-6; 2 Kings v. 10). And also after mourning, which always implied defilement (Ruth iii. 3; 2 Sam. xii. 20). A bathing chamber formed part of houses even of no great rank in cities from early times (2 Sam. xi. 2); and often in gardens. Among the wealthy anointing with perfumery was ordinarily conjoined; both customs in that warm climate being essentially pleasant and healthy. In later times of Jewish history public baths were set apart for this purpose. The Pools of Siloam, Hezekiah, and Bethesda (John v. 2) are the first indications of public bathing accommodation (Neh. iii. 15-16; 2 Kings xx. 20; Is. xxii. 11; John ix. 7). Jerusalem had a very remarkable system of reservoirs, aqueducts, rain conductors, and cisterns; while cisterns and wells abounded over the country, where almost every private house had its own cistern, some more than one, cut out of the lime-stone rock or built and cemented: in which the water kept pure and sweet even in hot summers. The extent of these engineering works may have been somewhat exaggerated; but the pools of Solomon of early date could retain three millions of gallons.
2. Isolation, segregation, or separation, more or less lengthy, of the individual. This part of the Hebrew ritual of purification, which cut off the individual from his fellows and many of his human privileges, for example Tabernacle service (Lev. xv. 31), implied that he and his citizenship was not only bodily but also spiritually, morally, socially, and physically in abeyance; sometimes to prevent physical infection, and in all cases to

promote the higher purity by the typical cleanliness of the isolation and the washings. This isolation was of two sorts, minor and major.

a The minor, from other persons and things in the tent and camp; as on the occurrence of certain female physiological conditions and minor pollutions.

b The major out of the camp; as in the case of leprosy, &c.

3. Lepers were required to cry "unclean, unclean," to give the pure warning of their vicinity, so as to avoid contact and contagion. This warning, which might be construed into public disgrace was merely enjoined for safety. The law was both typical and sanitary.

4. "Cut off." This evident and public disgrace doubtless means, if not death, at least more severe and lengthy isolation, deprivation of Israelitish privileges, and probably other marks of Divine displeasure, until the guilty or recalcitrant and disobedient came to a proper sense of their duty to God, His Sinaitic law, and themselves. These included not only those who "ate with the blood" (Lev. vii. 27), or fat of the burnt offering (Lev. vii. 26); but also such as did "presumptuously" regarding minor defilements, shewing contempt and disobedience of the legal injunctions regarding these (Numb. xv. 30; 1 John v. 16; Heb. vi. 4). Thus, any unclean person who ate of the flesh of the sacrifice of peace offering was to be "cut off" from his people (Lev. vii. 20). So also with the Israelite who ate of the leavened bread from the first to the seventh day (Ex. xii. 15) of the Passover. Also working on the Sabbath (Ex. xxxi. 15). For the laity compounding the holy anointing oil or putting it on a stranger (Ex. xxx. 33). So with the holy incense (Deut. xxx. 38).

5. The imposition of heavy sacrificial penalties was a frequent and potent mode of bringing uncleanness, impurities, and sins of all kinds, physical, physiological, moral, mental, social, and spiritual into disrepute. Then, as now, few things are more apt to prevent or lessen sin than pecuniary outlay. The nature and amount of these penalties is discussed under the head of Hygiene of the Tabernacle (Chap. 16, Part 2).

6. The loosing of the "*scape goat*" for expiatory purposes. For the occasions for this, and method, see Hygiene of the Hebrew Tabernacle (Chap. 16, Part 2).

7. Water of *purification*, *uncleanness*, or *separation* for expiatory sprinkling by the Priests. The occasions and

mode of making this "water" by the slaughter and burning of the Red Heifer have been described in the Hygiene of the Tabernacle (Chap. 16, Part 2). This was expiatory and a sin-offering. All the particulars connected with its preparation had a symbolic significance and appropriate symbolizing accompaniments. The "water" made by mixing ordinary water with the ashes was an antidote of expiatory efficacy (Numb. xix. 9). And the following points connected with it are noticeable:—

a The sex of the animal was *female*; *i.e.*, life-producing.

b The animal selected was unblemished, without spot, and *pure*.

c Its colour, *red*, was the tint of blood, the seat of life.

d The heifer must never have borne the yoke; its vigour was therefore unimpaired.

e It was selected young and strong, vigorous, and thus had life in all its freshness and fulness.

f Its carcase was burnt with cedar wood, denoting incorruption; with hyssop denoting purity; and with scarlet, the colour of blood. Moreover, the great virulence and Divine abhorrence of the "uncleanness" to be expiated was taught by the rules. Thus, 1st, it had to be *wholly* consumed, and *out* of the camp. In ordinary sacrifice certain parts were usually consumed on the Altar of Burnt Offering in the court of the Tabernacle, and only the debris *cast* outside of the camp (Lev. iv. 11-12). 2nd, Its blood was sprinkled *towards*, not *before*, the sanctuary. 3rd, The agent who did this was not the High Priest, the office being too impure typically. Nor was it even a Priest, the function being too important; but the eldest son of the High Priest, a selected Levite. 4th, Even the Priest who sacrificed and person who burnt the heifer's remains became unclean, by contact with the victim. 5th The purification was effected, not by water, but by this fluid mixed with a lye of ashes; and therefore from a chemical standpoint peculiarly cleansing. By this process of lixiviation an extra value is also given to sacri-

fice as a substitution; for it not only indicates the purity imputed but also a greater impurity imparted; the washing being made more potent literally as well as significantly by the alkali, the basis of soap, present in the ashes in the water, the chemical knowledge of which Moses inferentially possessed. It is clear that these ashes must have been often required, as it is impossible for a burial to take place without someone touching the body; and even during the Wanderings the burials in the embryo nation must have been numerous (Part 2, Chap. 17). It is said that after the settlement in Canaan some of the ashes were kept in every town.

This law regarding the water of purification was clearly typical only and not hygienic.

The constant, strict, and comprehensive attention to cleanliness, both physical and typical, that formed so important a part of the Hebrew Ritual was broadly educational; and meant to teach them several things, all of them lessons in life of the most important and practical value. Thus it inculcated:—

1st. Obedience to God and His laws. God's ownership of them was inculcated. God's mark was set on them, on their flesh and general entity; and on all their leading life events and relationships, hygienic and otherwise, as regards their soul, body, mind, and morals.

2nd. It marked and emphasized His perfect purity and holiness. The God of purity would have nothing to do with impure nations. Nor would he condescend to guide, guard, feed, clothe, fight for, or make such beings healthy, long-lived, and happy.

3rd. It inculcated the sacredness of the human body and entire entity of Man. And impressed that, as His chosen people, their corporeal purity and holiness ought to be fashioned after His model and correspond somewhat to His. "Ye shall be holy for I am holy" (Lev. xi. 44), applies to body or physical cleanliness as well as to ceremonial purity, and also enjoins moral and social as well as spiritual duties (Lev. xix. 2; xi. 44-45).

4th. It inculcated the necessity, not for physical purity of the body only; but cleanliness of the *whole* Man; soul, mind, morals, and social life. It was meant to teach that physical or body and "typical" purity, that is cleanliness of the higher nature, are all alike necessary to make and maintain human health, life, vigour, comfort,

and longevity: terms which include the entire human entity, physiological and psychical. Hygiene was thus sanctioned by religion, by promoting healthy observances of body. Thus the custom of using the bath before the introduction of persons of rank and importance, explains its special use on personal appearance before God on occasion of religious ministration (Ruth iii. 3). Hence the use of the lavers (Ex. xxx. 18-21). Nay, Hygiene was thus made a part of and factor in religion; inasmuch as the Christian will consider it both a duty and a privilege to obey every law of God; the hygienic as well as the moral, social, and the spiritual.

5th. To teach and shew body cleanliness as typical, suggestive, tuitional, and inculcative of the higher or spiritual forms; and the latter again as incentive of body cleanliness. The rite most frequently enjoined for removing ceremonial pollution and that which removed physical impurity was the same, namely, washing with water.

6th. To keep the Hebrews select and apart from other contaminating and impure tribes and nations, by whom they would have been soiled physically, physiologically, and defiled morally, socially, and spiritually, by intermarriage and otherwise. They were kept separate from other peoples (Lev. xx. 24) as "holy unto God" (Lev. xx. 24-26); as "a kingdom of priests and a holy nation (Deut. xxvi. 19); and so as distinct from them in their hygiene as in other departments of the law which guided their life, their "rôle," and their future. They were to be kept under the best hygienic laws and influences regarding cleanliness in body; and in all things thus kept healthy and apart from all unhygienic laws, customs, and influences; thus kept free from the diseases and disasters of other nations. Many of the ordinances regarding outward purity, which only the priests of other nations, *e.g.*, Egypt observed, were publicly obligatory on the entire Hebrew nation; among whom each individual was a priest to God (Ex. xix. 6): and the entire nation a kingdom of priests.

7th. To teach the Hebrews theoretical and practical hygiene; to be disseminated by them to other nations: and among other things to teach mankind the chief factor in hygiene; thereby to enable them to keep themselves healthy by the practical application of cleanliness. And further to propagate the leading factor in the doctrines of this the leading department

of medicine, the *preventive*: that part which alone God condescended to divulge and teach in and by His Holy Scriptures.

Jehovah, in legislating and codifying His laws for Hebrew "cleanliness," typical and hygienic, uses the same agents that He employs for the same purpose in the daily routine of the Tabernacle; and the same He employs for compassing the far mightier and wider cleanliness and purification of the world of Nature; especially the atmosphere and the ocean, namely, air, water, and fire or heat: instruments at once the most abundant, cheapest, most easily and safely manipulated and most efficacious of all the cleansers and purifiers the world possesses: the two former, air and water, acting by dilution and dispersion of obnoxious matters; and the latter, still more efficacious, by total destruction and chemical reconstruction into less dangerous or inoccuous compounds.

1. Water was chiefly used for the cleansing of substances polluted, and acts first by dilution, and second by dispersion of the solids, liquids, animal and vegetable debris and micro-organisms.
2. Air. This agent, acting first by dilution and second by dispersion of noxious gases and vapours, was largely used for purifying the atmosphere of the Tabernacle and camp (Part 2, Chap. 16 and 17).
3. Fire or heat was also largely used in the sanitation of the camp (Part 2, Chap 17), and especially the Tabernacle (Part 2, Chap. 16):—
    a It was thus that much of the sacrificial matter, animal, vegetable, and mineral, was got rid of, or rendered inoccuous. For connection with this, fire was chiefly used in the hygiene of disease. Thus to destroy leprous clothes, &c. No more efficacious mode of cleansing these and the world of the morbific leprous microbes (Bacillus Lepræ) could have been devised; as these were totally consumed, and with them the danger of fresh infection and contagion.
    b The frequent fire of the Altar of Burnt Offering; and the perpetual though much smaller one of the Altar of Incense; acted as an uptake to ventilate the oft-crowded and frequently mal-odorous Tabernacle Court, and purify its air, and indirectly that of the entire camp (Chap. 16 and 17, Part 2).
4. Disinfectants and deodorants. These are more fully entered into in the hygiene of the Tabernacle (Chap.

19). The spices that were constantly burnt in the Holy Place, often wafted over the camp, and at least over the Tabernacle and its vicinity, to saturate the clothing of the Priests, Levites, and congregation; would also tend considerably to keep the air of the entire camp pure and free from microscopic morbific germs. It is these ocularly unseen foes that contribute most to render many kinds of air highly dangerous and disease-inducing.

Of these physical cleansers water was the most important and oftenest used: and to it we must turn our chief attention. Washings of different kinds formed a frequent, important, and imperative factor in the Mosaic Law. These were of various degrees and frequency, and inculcated for many different forms of "uncleanness." These were carried out with water; Nature's most potent, simple, abundant, and universal depurative: thus—

a Body cleansing. The occasions on which, for ceremonial or typical "pollution" and "uncleanness," the body, or parts of it, especially of the skin, hands, and feet, were ordered to be purified and cleansed with water, were numerous. The human body has God's mark on its construction and workings; the stamp of its Divine Maker, Owner, and King, Jehovah; and one that excludes all rivals. This is noted not only by the Mosaic Law regarding cleanliness, but also by other parts of the law. Thus it is why He gave the Divine injunction, "Ye shall not make any cuttings in your flesh for the dead, nor print any marks upon you" (Lev. xix. 28). And also why He ordained that "thou shalt rise up before the hoary head, and honour the face of the old man, and fear thy God" (Lev. xix. 28-32). As in these instances, the sacredness attached to the human body, especially that of the aged, is evident throughout Scripture. Even the hairs of our head are numbered (Mat. x. 30). That all the members of our frame are written in God's book, even before they are differentiated and evolved in the microscopic cell from which we are each developed, is a fact well known to embryologists (Ps. cxxxix. 15). All these inculcated body holiness in that which God made specially, and takes such paternal interest in. Hence also why the general hygiene of the body and its different entities is made so elaborate and minute; and why its chief factor "cleanliness" is made so prominent typically and hygienically. In connection with physical cleanliness we must remember that the exigencies of the warm climate and seasons

of Egypt, the Desert and Holy Land, required unusual cleanliness; and that:—

1st. This necessitated frequent washing to remove perspiration and dust; thus to contribute both to comfort and health.

2nd. Looser clothing, which, while it permitted better ventilation, also allowed clinging to more exposed parts, especially the legs, ankles, and the sandalled feet.

3rd. The state of the body in those regions is apt to be more lax and predisposed to the encroachment, generation, and spread of contagion and morbid action generally.

Hence the obvious utility of re-inforcing physical hygienic observances and customs regarding cleanliness, and, lacking these, by the sanction and observances of religion. Even the worry and burden of this greater attention to cleanliness conduced materially both to personal comfort and health. Cleanly observances induced comfort and health: and these again contributed materially to induce the continued repetition of the boon. The general bath was an ordinary preliminary to a ceremonious introduction to persons of rank or importance (Ruth iii. 3; Judith x. 3). Nor is it surprising that it should be specially enforced on all occasions of religious ministration, viewing this as a personal appearing before the King of Kings, who is *perfect* purity. And we can thus easily understand the chief office of the lavers of the Sanctuary for God's special servants and service of the Tabernacle, whose hands and feet were both often soiled by blood, ashes, perspiration, &c. (Exod. xxx. 18-21). Body cleansing and washing with water, according to the Mosaic Law, was thus not only typical but also highly pleasant, cleanly, and sanitary. According to the law the body had to be washed

a After entering a tent containing a corpse.
b „ touching a slain body.
c „ „ a human bone.
d „ „ „ „ grave.
e „ disease, *e.g.*, leprosy (Chap. 32).

The bath was a prescribed part of the Hebrew ritual of purification in cases of accidental leprosy or ordinary uncleanness (Lev. xv.; xvi. 28; xxii. 6; Numb. xix. 7-19; 2 Sam. xi. 2-4; 2 Kings v. 10): also after mourning, which always implied defilement (Ruth iii. 3; 2 Sam. xii. 20).

b Washing the *Hands* was particularly attended to by the Jews; and their cleanliness more regarded than that of other parts of the body; and wisely so, for obvious hygienic reasons; they are in constant use and thus so frequently soiled. Among other things they used no knives or forks; but their fingers in eating. Hence it was absolutely necessary that the hands by which they ate from the common dish should be scrupulously clean, as a sanitary measure for themselves and others. Washing of the hands before meals is still universally prevalent in Eastern Countries. Many morbid matters, chemical, organic, microbic, and otherwise, might be added to the food from soiled, unwashed hands, and thus conveyed into the stomach to engender disease. The custom was therefore, and still is, not only typical but also largely hygienic, and conducive not only to comfort but also to health.

c Washing the *Feet*, was and still is frequently necessary there, because of the warm perspiration-inducing climate, and also the open sandals worn, so ineffectual against dust and sand of the desert, and the constant use and exposure of the feet (Mat. xv. 2; John xiii. 10). To have the feet washed therefore on entering a house was an act both of respect to the company, and of refreshment to the traveller; and especially necessary, as at the present day in congregations, when they kneel closely in worship. Washing the feet held a high place among the rites of hospitality (Gen. xviii. 4; xix. 2; xxiv. 32; xliii. 24). The feet were again washed before retiring to rest (Cant. v. 3). On festive occasions, after washing, the feet were often anointed (Luke vii. 38; John xii. 3). This was no doubt typical both before and during devotions when the sandals were removed (burning bush). In social life feet-washing on entering a house was necessary for refreshment; and as an act of respect to the host and company. The necessary materials were presented to the guest immediately on his appearance at the tent or house door. For the host to wash his guests feet (1 Sam. xxv. 41) was a complimentary act, indicative of humility and affection. This custom by the host or a deputy is still prevalent in the East. No one can deny the evident and deeply hygienic nature of this custom of frequent feet ablution in those regions, and with feet thus openly clad. The Priests after their many bloody sacrifices, which must have deeply soiled both hands and feet, were required to cleanse these by frequently

washing both (Ex. xxx. 19-20) at the laver expressly provided for that purpose.

d Cleansing of the *Clothes* was also frequently enjoined by the Hebrew Law. Thus the clothes had to be washed as part of their ritual. As the clothing is very receptive, secretive, and retentive, not only of offensive excretions from the body, but also of morbid germs both from that and the atmosphere, microbic, chemical, and otherwise; and might transmit them to others to propagate; even after long periods of disuse; this law is wisely sanitary and preventive as well as typically pure. The chief occasions on which the law enjoined cleaning of the clothes were:—

1. After entering a tent containing a corpse.
2. „ touching a corpse, slain.
3. „ „ a human bone.
4. „ „ „ „ grave.
5. „ „ „ „ corpse.
6. „ „ an "unclean" person.
7. „ many diseases (Chap. Hyg. of Disease).

The last is a frequent injunction; partly typical; but also and clearly largely hygienic and preventive of disease. The first six are also typical; but also obviously preventive of germ and other diseases, and thus largely sanitary. The fact that the Israelites of that day could not have many changes of clothing, and, as in later times, often slept in their day garments or made only a slight change, made this law especially necessary (Ex. xxii. 26-27). At the present day the hyke or cloak is often the poor man's only covering, and even his bed at night.

e Cleanliness of the *Bedding* and *Coverlets* was also enjoined, as shewn by their being deemed ceremonially unclean for seven days if in a tent where a dead body lay. Uncleanness was also communicated to the bed from an unclean person. This typical cleanliness was also and clearly of great sanitary importance. As the material might and probably would in both cases absorb emanations, microbic and otherwise morbific, from the corpse or bedding to spread to others as dangerous disease.

f Cleanliness of open vessels was also enjoined when these were found in a tent with a corpse. This is also typical; but clearly of sanitary import also. As germs of any contagious or infectious disease from which the person may have died would be most likely to settle as dust if the vessel was empty or be absorbed by its

contents if it contained solids, liquids, or semi-fluids, which might infect others when eaten or drunk. A noteworthy fact is that while unclean wooden vessels generally might be purified by washing with water, earthenware utensils and the "pot oven, or range for pots" (Lev. xi. 35), all of them absorbent of morbific matter must be *destroyed*, and thus all putrescent or infectious matter that might have been absorbed and continued lurking, and might infect others, thus acting as new foci of disease, scattered. Cleanliness of vessels is a frequent ordinance in the hygiene of disease (Part 3, Chap. 1).

g Cleanliness of *Tents* was also enjoined: when a man died therein and it thus became ceremonially "unclean." This was typical cleanliness, but also hygienic, as the tent might and probably would have absorbed poisonous morbid odours or germs of the disease, if the person had died of an infectious or contagious disease: and might thus spread this to others. This law applied to *rooms* and also *houses*. Cleanliness of the latter is an important item in the hygiene of disease, especially leprosy (Part 3, Chap. 2). It also applies to communities and camps both in health and in disease: and was another great factor in the Hebrew law (Part 2, Chap. 17). In all these cases the typical is apparent; and emphasized the camp and Tabernacle as God's special earthly abode (Exod. xxv. 8), which therefore ought to be specially pure (Part 2, Chap. 16). But they were also and very largely of hygienic import and intention (see Hygiene of Hebrew camp). The cleanliness of the Hebrew Tabernacle or Church was more especially marked. This was because it was God's special abode and Holy Place; but also because there the congregation often massed and sacrificed; and thus rendered it apt to become a special focus for the inception and propagation of disease especially infectious and contagious.

h Cleanliness of *other things*. Thus of *saddles* was also enjoined if one was in a tent with a dead body (Lev. xv. 9); or had been sat on by an unclean person (Lev. xv. 9). These were both typical; and like other things above mentioned inculcative of the necessity for purity in *all* things; and the danger and likelihood of one form of uncleanness begetting others. But they were also hygienic, as disease germs might thus also be conveyed from the dead body to living persons. In modern times infectious diseases have no doubt been

often conveyed from the ailing to the sound by letters, gloves, coins, and other curious and unsuspected ways.

The term "defilement" included the contraction of unlawful marriages and the indulgence in unlawful lusts, denounced in Levit. xviii. Even sowing heterogenous seeds in the same plot (Deut. xxii. 9); mixing materials such as linen and woollen in a garment (Lev. xix. 19; Deut. xxii. 11); sexually mixing cattle of diverse kinds (Lev. xix. 19); and ploughing with diverse animals, as an ox and an ass, in one team (Deut. xxii. 11). This law of cleanliness is frequently spoken of in the hygiene of disease, as affecting physical things, clothing, houses, &c., &c.

Cleanliness of the High Priest, Priests, and Levites was also more specially enforced than for the people: because they were selected and presumably holy men, set apart from God's special people, the Hebrews, themselves a Holy Nation (Ex. xix. 6) and Kingdom of Priests (Ex. xix. 6) for Jehovah's Tabernacle service, and for the inculcation and enforcement of the law which it was their particular duty to study, teach, and enforce. As with modern clerics, as educated, superior men, well versed in God's law, they were expected to set the best example to the more careless and less erudite laity, on matters of cleanliness and obedience to the Mosaic Code in its entirety. Those who ministered as they did to God, and acted as intermediaries between Him and the laity, were expected to approach Him with clean bodies, garments, hearts, and souls. The law regarding cleanliness and penalties for its transgression were as obligatory on them and the Levites as on the congregation, and even more so, as they could not plead ignorance or want of time, for disobedience. The consecration of Aaron as High Priest, his sons as Priests, and their successors, was attended with special ceremonies, cleansing, and purification. These Levites were God-selected "to minister unto Me in the Priests' Office" (Exod. xxviii. 1-4). Moses had to bring Aaron and his sons "to the door of the Tabernacle of the congregation and shalt wash them with water" (Ex. xxix. 4). This was a general and entire washing and purification on installation into their office and first admission to the Sanctuary. Another washing was partial and daily repeated within the Court of the Tabernacle before sacrificing and before entering the Tabernacle (Heb. x. 19-22). The High Priest and Priests were men of the highest rank, presumably physically cleanly, and altogether free from disease or danger of spreading infection. And no one can for a moment suppose these ceremonies were anything else than purely typical of spiritual and moral purity and wholly unconnected with physical or body hygiene. Similar ceremonies were followed on consecration of the Levites. Jehovah spake to Moses thus. "Take the Levites from among the children of Israel and

cleanse them. Sprinkle the water of purifying upon them, and let them shave all their flesh, and let them wash their clothes, and so make themselves clean" (Numb. viii. 5-7). The Levites were a specially pure, God-serving, high-class tribe (Ex. xxxii. 26-29); selected for their zeal for Jehovah's honour. "For they are wholly given unto me from among the Children of Israel. And I have taken the Levites for all the first-born of the Children of Israel" (Numb. viii. 14, 16, 18). And, as with their leaders, the family of Aaron, these consecration laws are evidently mainly, nay, wholly, typical and not physically hygienic.

Not only were the Levites, Priests, and High Priest regarded simply as human beings, and therefore under the law and amenable to its penalties regarding cleanliness, like the laity. But certain parts of their ritual connected with their Tabernacle functions rendered them "impure" or "unclean": thus—

1. The Priest who killed the red heifer to make the water of separation and who sprinkled her blood before the Tabernacle was "unclean" until even; and had to wash his clothes, and bathe his flesh in water (Numb. xix. 7-8). This was perhaps chiefly typical and meant to inculcate that whoever acts for the cleansing benefit of others must recognize this is also necessary for themselves. But still there was also a possibility that although the heifer was supposed to be selected carefully and wholly unblemished, its blood and tissues might contain infectious or contagious germs of impending or latent disease, which the Priest might receive and spread to others.
2. Again, the ashes of the red heifer, burnt entire, according to regulations prescribed in Numb. xix., and which mixed with water was the standing resource for purifying uncleanness in the second degree; had the ceremonial efficacy of purifying the unclean and the water (Heb. ix. 13); but of polluting and defiling all who were clean. The administering Priest and Levite were thereby made unclean in the first or lightest degree (Numb. xix. 7). This uncleanness was evidently typical only.
3. Again and similarly the scape-goat that bore away the people's sins defiled him who led him into the Wilderness, and made him unclean in the lightest form. This uncleanness also was clearly typical only: the uncleanness of the victims being communicated to those who had to do with them. The resulting ordeal included washing his clothes and bathing in water ere he returned to the camp (Lev. xvi. 26-28).

4. So also the bringing forth and burning the sacrifice on the great day of Atonement had a like power of causing purely typical uncleanness in light form; expiated by bathing the body and washing the clothes. These special typical injunctions and penalties for the Priests and Levites alone were inculcative of excessive physical purity; which must have been secondarily instructive, beneficial, and tuitional of spiritual, moral, social, and physical, *i.e.*, hygienic cleanliness; alike educational and good for body, heart, and the soul of those on whom they were imposed, and of those who witnessed or knew of the ordeal in question.
5. Again, the bullock and goat for the sin-offering, after the fat on the inwards, caul, about the liver, and the two kidneys and their fat, were burnt on the Altar of the Tabernacle; the remains had to be carried forth by one without the camp, and there burnt with fire, with their skin, flesh, and dung (Lev. viii. 16-17). He who burned them had to wash his clothes and bathe in water ere he returned to the camp. This purification was clearly typical, and meant to deepen the sense of sin by every available means; and to inculcate purity of heart and body. But it may also have been partly hygienic, as the work was physically defiling and might transfer disease from the blood, flesh, skin, hair, &c., of animals, with still latent disease. It may not have been always possible to bring perfectly healthy animals for sacrifice. Slightly disease-stricken ones might occasionally elude the selectors' vigilance and skill.
6. So also the flesh and hide of the calf of the sin-offering that Aaron offered for himself as High Priest, after his consecration, was burnt with fire without the camp.
7. Again, if a Priest touching anything rendered unclean by the dead; or was defiled by a creeping thing; or even by a defiled man or woman, he was thereby rendered unclean till even; and forbidden to eat of the Holy things with his food till he had washed his flesh with water (Lev. xxii. 4, 6, 8). This was typical, but clearly also hygienic and preventive of disease, especially of the infectious or contagious kind.
8. Even Priests were forbidden to eat that which died of itself (Lev. xxii. 8); or that which had been torn with beasts. If he did he became defiled and had to undergo the penalty. This law was typical; but also and largely hygienic. The priestly office sheltered no one from disease; except by increasing both the knowledge, opportunities, and the means of avoidance.

According to the Sinaitic Hebrew ritual the human body might be made ceremonially "unclean" or "polluted" by various often avoidable common events or casualties frequent in every-day life: which had to be expiated to restore its cleanliness. Thus any person might be defiled:—

1. By the dead human body. Thus if a man died in a tent, all the people in or who handled the tent; as well as all the coverlets upon vessels, furniture, or whoever touched any of these, were deemed unclean for seven days. Whoever touched the body was unclean for seven days. On the third day he purified himself. On the seventh he was clean. So also everyone who entered the tent was unclean in the first degree. Again, everything touched by any of these was unclean for seven days. Again, whoever touched any of the last mentioned was also rendered unclean in a minor degree till even. This ordinance as a whole was meant:—
   - *a* To prevent unnecessary or superstitious practices with the dead; for example, embalming, of which Jehovah disapproved; thus ensuring speedier burial; before sunset on the day of death (compulsory by law for those hanged), (Deut. xxi. 23), a function meant to be the general practice, simple, unostentatious, but not irreverent or negligent.
   - *b* Moreover, it helped to keep before the people the *typical* connection existing between sin and death. The dead body is no longer the individual; only his soul's late perishable temporary abode. The sense of pollution lay in the mere fact of death; and that both death and birth are connected with sin and defilement and soul pathology.
   - *c* It was also distinctly and decidedly *hygienic* or sanitary; and preventive of infectious or contagious diseases and defilement, in warm regions where plague, cholera, leprosy, and other dangerous and very deadly or loathsome communicable ailments might be transmitted to medically ignorant relatives and friends.

   Whosoever neglected this law of purification after touching a dead body, and entered the Tabernacle, "defiled the Tabernacle of the Lord," and the soul was to be cut off from Israel (Ex. xix. 13).
2. Again, whoever touched a body slain by the sword in battle in the open field, thereby became unclean for seven days (Numb. xix. 16). This law was mainly

typical, but also hygienic; as infection or contagion might be communicated by the body or its clothing. After the first Midianitish war whoever killed any of the enemy, or even touched the slain, had to be purified on the third day *out of the camp* (Numb. xxxi. 19), and were deemed impure for seven days. While their woollen, hair, or skin garments had also to be purified, and every gold, silver, brass, iron, tin, or leaden article in their possession had to be passed through the fire and then sprinkled with the water of separation. On the 7th day their clothes had to be washed.

3. Whosoever touched a human bone was also unclean for seven days (Numb. xix. 16). This was mainly typical; but also hygienic and preventive of disease, like 2.

4. Whosoever touched a human grave was likewise unclean for seven days (Numb. xix. 16). This was also typical and hygienic. This, like No. 1, 2, and 3, had to be purified by sprinkling with the water of separation, washing of clothes, and bathing in water (Numb. xix. 19-20; xix. 11-18). In the case of No. 4 the whole of the earth above the body was deemed unclean. This rule prevented morbific or disagreeable smells being inhaled by the careless approach; and also the dissemination of microbic, infectious, or contagious germs; many of which breed rapidly, or at least survive in earth, *e.g.*, those of cholera, yellow fever, &c. From this law sprang the custom of leaving a covered space above the body; which tended to interrupt these dangerous incidents; and facilitated dispersion of malodorous and noxious or disease-generating gases.

5. Spitting on a "clean" person by one with an issue caused uncleanness. It also sometimes conveyed defilement and its penalty even when the individual was not diseased (Numb. xii. 14). This soiling of the body or clothing by another person's salivary, throat, or lung secretion is clearly typical. But when, as might happen, the spitter was afflicted with a contagious disease, the expectoration might contain morbific microbes, such as those of phthisis, diphtheria, cholera, the law was markedly hygienic and preventive, as the saliva might contain the dangerous pathological pollution of infection. The penalty for this spitting was that the person spat on had to wash his clothes, bathe himself in water, and be unclean till even (Lev. xv. 10). (See also Deut. xxv. 9; Mat. xxvi. 27; xxvii. 30.)

6. Uncleanness might also be occasioned by or come from the lower animals; beasts, cattle, or creeping things.

Thus, all animals unclean to eat were also unclean to touch *when dead*; but not conversely. When the former occurred the offender was unclean till even (Lev. xi. 8-31). Even if a soul touched such a carcase, hid from him at the time, but which afterwards came to his knowledge, he was also deemed unclean. This was typical of death; and yet was also unmistakeably sanitary; as the carcase might be putrid and germ-laden, and thus morbific. Even in such a case if another touches the uncleanness of the first, whatsoever that may be, and it afterwards comes to his knowledge, he is unclean, and a trespass or burnt-offering had to be brought, by which the Priest had to make atonement for him (Lev. li. 6).

7. Whoever touched the body of a typically "clean" animal which had died of itself was also by analogy unclean till even. This was typical, but also hygienic, as the typically clean animal might have died of some infectious disease communicable to man.

8. Or touching a "clean" animal fatally torn; this made the toucher typically unclean till even; but it was also sanitarily wise, as the accident might have imparted a communicable disease to the animal. Or some communicable disease might have been originated by putresence. Many diseases, especially infectious or contagious ones, are communicable from the lower animals, especially the domestic ones, to man; and vice-versa; and in both cases both directly and indirectly. Direct infection or contagion from the lower animals to Man is shewn by the latter being affected by glanders and foot and mouth disease from horses; hydrophobia from dogs, cats, &c.; scarlatina from cats, cows, parrots, swine (Rothlauf; Rouget); small-pox from the cow's udder (vaccinia); phthisis from cats, cows, &c. So also disease may originate in Man by its germs being introduced by animal produce, *e.g.*, scarlatina or diphtheria, &c., by milk. This is even more likely to occur. Those dangers are materially lessened by laws 6, 7, and 8.

9. Whoever touched the "water of separation" accidentally was rendered unclean till even: and also, secondarily, whatever he touched. This was clearly typical only; and meant to inculcate the highest reverence for holy things; and all matters connected with Jehovah and His service.

10. Anything or anyone touched by an unclean person rendered them unclean till even. This is clearly

hygienic as well as typical. As the touched person might be infected and prone to spread disease.

11. Many diseases and certain physiological conditions begat uncleanness of different degrees, and incurring different penalties. (See Hygiene of Disease.)

12. The liberator of the scapegoat likewise became "unclean." (See installation of Priests.) This was clearly typical.

13. The burner of the bullock and goat for the sin-offering on the day of Atonement also became "unclean." (See "Uncleanness" of Priesthood-ante.) This was only typical.

14. Eating certain foods made a Hebrew "unclean." For example, any of the list of dietetically "unclean" animals (Lev. viii. 31; Deut. iv. 4), in other words animals forbidden by the law for food. (See Food, Part 2, Chap. 2). According to this law, eating part of an unclean animal rendered the eater "defiled"; as did touching or carrying its carcase (Lev. xi. 25). It was "an abomination" to touch and far worse to eat these. But the converse did not hold good. So also all animals unclean to eat were also unclean to sacrifice. But the converse of this did not hold good. The forbidden "unclean" meats, which if eaten caused defilement, included not only those in the forbidden list (Lev. viii. 31; Deut. iv. 4), but also all animals, even the "clean" varieties, which had died of themselves. Also those eaten with the blood, *i.e.*, either improperly killed and inefficiently bled. Those persons who transgressed this law, and ate of or touched an "unclean" or even a "clean" animal that had died of itself, or one imperfectly freed of blood, were defiled; as was also any garment, sack, skin, vessel, or its contents which touched or fell on them. All of these had to be "purified" typically by being deemed unclean till even, and by washing or scouring. If the vessel was an earthen one it had to be broken and rendered unfit for further use, because it was porous and so absorbable of poisonous matters and morbific germs: as Brahmins break a vessel out of which a Christian drinks. Again, if the unclean carcase fell on or touched an oven or range for pots the oven or range had to be broken down, because absorbable of unclean or morbific matters. Only a fountain with running water or a well-filled and large pot containing plenty of water, remained clean, except the portion which immediately touched their carcase (Lev. xi. 37).

Again, if any part of their carcase fell upon seed about to be sown, the latter remained clean and undefiled (Lev. xi. 37). But if the seed was wet it became unclean by contact with the carcase (Lev. xi. 38). Moreover, the water in which the defiled garments, skins, vessels, &c., were washed, also became "unclean" thereby. Or if any of this typically soiled water happened to fall on meat, the latter was defiled thereby and deemed unclean (Lev. xi. 34). The person who transgressed on any of these points, and either ate, touched or carried such carcases were deemed "unclean" till even, and had to wash his clothes. But in the case of eating blood or flesh improperly bled, the penalty was being "cut off" for "doing presumptuously," and thus despising legal provisions God ordained (Lev. xi. 17, 14).

All of these strict and minute laws and restrictions regarding food, feeding, and animal produce was clearly educational and partly typical regarding death; partly tuitional of purity and cleanliness of body as inculcative of and inducing purity of soul, conduct, morals, thought, word, and deed, all so acceptable to God, and indispensable for his service. They likewise strengthened the spirit of human obedience to his laws, hygienic and otherwise; strict observance of his higher precepts; and the cultivation of Godly reverence, faith, and holiness. They also tended, like other laws, to keep the Hebrews from mixing with and imitating surrounding idolatrous peoples. In the light of modern medical microscopic science and bacterial biology, the hygienic import is also obvious and strong. By these laws and restrictions much infection and contagion and many infectious and contagious diseases might be either prevented or lessened; especially those arising from eating or touching diseased and microbe or poison-laden meats; many of them communicable and deadly to man and apt to generate wide-spread and disastrous ailments which may be obviated by strict and wise obedience to the laws of the supreme and infallible sanitarian. Nor can anyone deem these laws purely ceremonial and typical; but consider them very largely hygienic and meant to be preventive of disease. Many of the most frequent and worst diseases are communicable by *contact*.

15. So also whoever ate of the sacrifice of peace offering pertaining to the Lord; "having his uncleanness upon him," was to be cut off from his people (Lev. vii. 20). This included any soul who had touched any unclean thing, as the uncleanness of man, or any unclean beast, or any abominable unclean thing (Lev. vii. 21). This law was clearly typical only, and meant to indicate and

inculcate the necessity for purity in all persons and things when approaching God or performing sacred functions.

16. Mourning always implied defilement and uncleanness, as connected with death (Ruth iii. 3; 2 Sam. xii. 20). This was clearly typical only; and not sanitary.

17. Sexual contact rendered both parties "unclean" in a mild manner, requiring simple ablution of the person (Lev. xv. 18; 2 Sam. xi. 4) on the day on which the uncleanness was contracted. This restriction had its hygienic aspects, and was more than typical. Thus first, it tended to discourage polygamy. Second, in monogamy it tended to preserve the health of the parents and provide for that of their children, by preventing excess. Third, physical cleanliness then and there is a potent health preserver and disease preventer. This will be clear to medical minds. It is not the face and hands alone that require ablution when soiled.

18. Intercourse with a woman during her periodic separation incurred not only "uncleanness" in both principals, but also the penalty of both being "cut off from among their people" (Lev. xx. 18). This law was agreeable to tradition (Gen. xxxi. 35): and was doubtless enacted to forcibly impress the imagination with an idea of the loathsomeness of this state, and the heinousness of the act then, more than of the defilement alone to the first person merely. This defilement, moreover, was also propagated from the person to the bed, saddle, clothes, &c.: and even through those to other persons (Lev. xv. 5, 6, 9, 12, 17, 20, 22, 24, 26, 27). This threw a broad area round these "unclean" and warned all off by ample boundaries. But to the typical bearing of this law there is an obvious and strong hygienic meaning. The necessity for sanitary cleanliness is tenfold more obvious during this condition; and the chance of giving and contracting disease, likewise greatly increased. Then as now and always, the necessity for scrupulous and additional cleanly habits for both sexes is obvious and great; and this law, like many more in the Mosaic Code, is clearly applicable to mankind in all regions and periods of time: as a sanitary precaution. The pathologist can quote few organic fluids that are chemically more unstable, rapidly putrescent, or more quickly a suitable soil for microbic development of pathogenic organisms, than those of the male and female human species.

19. Certain sexual conditions rendered both men and

women "unclean" until even, and also every garment or skin they touched: necessitating washing with water both of the person and article. This is clearly hygienic as well as typical.

20. Special cases of male and female and intersexual defilement rendered persons unclean (Lev. xii. 15; xv. 2-8). The plague "for Peor's sake" was probably "Gonorrhœa benigna," derived from the Moabites (Numb. xxv. 1, 8, 9; Deut. iv. 3; Josh. xxii. 17). This is clearly more than typical.

21. The "uncleanness" imposed on self-pollution, and on involuntary nocturnal dreams, is physically hygienic as well as morally salutary and typical. And is, moreover, highly and properly suggestive to parents of the duty of vigilance over their male offspring.

22. The law of marital separation has a distinct and important salubrious tendency, as well as typically meant. Childbirth caused "uncleanness" of 40 days after a son and 80 days after a daughter. Some of the most frequent of our human physiological or pathological conditions, male and female alike, cause "uncleanness," *e.g.*, pollutions, the periods, and various frequent diseases (Chap. Hyg. of Dis.) These cases are clearly not only typical, but also and very largely hygienically utilitarian in a practical and disease-preventive point of view. Cleanliness in all of these sexual conditions is most essentially imperative and sanitary. And no doubt then as now, but for this law it would often have been evaded. Indeed the hygienic and disease-preventive import of cleanliness, physical and ceremonial, in all such matters, in every condition and state of the sexual organs in both sexes cannot be over-rated, and are well-known to medical men. None know better how often this cleanly hygienic disease-forestalling indication is neglected, and how frequently this alone is the source of much troublesome and even loathsome disease in both sexes; a subject more fully spoken of in a following chapter.

23. Defilement and uncleanness was also incurred by contracting unlawful marriages (Deut. vii. 3). And also by indulging in unlawful lusts as denounced in Lev. xviii.

24. Certain proceedings in ordinary life were forbidden; and incurred "uncleanness," *e.g.*, sowing heterogenous or mixed seeds in the same plot; mixing materials such as linen and wool in one garment; the sexual admixture of diverse cattle or animals in ploughing or

in team (Lev. xix. 19; Deut. xxii. 9-11). But no specified term of defilement or mode of purification is given.

25. Corresponding to these is the law ordaining that the fruit of trees was to be deemed as uncircumcised, that is "unclean" for the first three years; and on the fourth year set apart as "holy to praise the Lord withal." Tree fruit therefore was not commonly eaten till the fifth year. Hence it was best to prevent early bearing by plucking off the blossom in early years. This law was economic and wise and botanically hygienic; as it prevented bearing till maturity; thereby nursing and fostering the vitality and productiveness of fruit trees and the yearly increasing excellence of the fruit crop.

How complicated and sometimes perhaps unnecessary all these laws and regulations and penalties may seem to many of us, especially to the laity, and how difficult for the Priests to master and successfully manipulate! But how easy to the Hygienic Mastermind to devise the best means for the wisest ends; and to legislate comprehensively in this all-important and hygienically fundamental matter of physical cleanliness; and to make one act and law serve a double end, and be both typical of higher cleanliness, and sanitary as regards that of the body. To inculcate physical or body purity is often not only to teach purity of the person both external and internal; but also to typify and incite by its many inactments to purity of the higher nature, the morals, mind, heart, and soul. So, on the other hand, purity and cleanliness of these four, our holier parts and instincts, are made the instruments to inculcate and promote physical or frame cleanliness, by elevating our ideas of the importance and the rôle of the human body as Jehovah's handiwork and property; the dwelling-place of the human soul; and the heart as God's throne and Holy Ghost's temple. This manifold Hebraic law regarding physical cleanliness is only a part of the wider and more comprehensive law inculcative of purity of the entire human entity, each of increasing importance, mind, morals, heart, and soul. Purity is one of Jehovah's greatest attributes, and he would fain have his creatures resemble himself. The Hebrew camp had to be kept pure, and the Tabernacle (Chap. 16 & 17), and so had they. "Ye shall be holy as I am holy; therefore sanctify yourselves" (Lev. xi. 44). As human beings the Hebrews sanctified and pleased God by obeying His hygienic laws as much as by fulfilling the Decalogue. And so may and ought we who are as much Jehovah's pupils in sanitary science as were they.

The wisdom of the Mosaic private hygiene regarding cleanliness, as with the other hygienic factors of food, drink, exercise,

&c., is shewn by the fact that on every conceivable occasion and in almost every circumstance of life: in health and in sickness, it inculcates the great value of cleanliness: not of hands, feet, and face only, but of the entire body. And not of the latter alone, but also of the clothing and the bedding. And not of the latter only, but of every household utensil and article of furniture; nay of the dwelling itself, inside and outside; and of all that goes on within it, the cooking, &c. The sum total of all this was the increasing cleanliness and purity of the air the Hebrews breathed; of the food they ate; and the beverages they drank; in other words, of the three channels by which much disease is focussed and introduced into the system. The prescience of this teaching and these inculcations will be all the more readily perceived by sanitarians in the light of modern research: and with the knowledge that it is impure stagnant water, foul seldom renewed air, unclean food, soiled dust-laden clothing, &c., that the microscopic germs of many of the most deadly diseases lurk, until they find a suitable soil or person in or on whom to fix and germinate. Lessen the amount of uncleanness; in other words, increase the purity of all these things, household and otherwise, and we will thus lessen the amount of soil suitable for microbic multiplication and curtail the foci in which these persistent and stable microphytes may lurk and germinate. Indeed there is no disease germinator and aid like uncleanness in its every shape and form. No more potent health factor and promoter than cleanliness in every form exists. One of the most difficult of tasks is to impress on the minds of the ignorant that disease of any kind, and especially of these deadly forms, may be originated by matter and forms so minute as to be ocularly invisible, except when magnified by high microscopic powers: and that even a soiled hand may infect all that it touches, whether belonging to ourselves or to others, and so initiate and spread new disease by the clothing, utensils, bedding, food, drink, ornaments, books, saddlery, and so forth *ad infinitum*. It is to meet this danger that much of the Mosaic hygiene of cleanliness has been formulated; and for which it takes pains to minutely enumerate much of what may be rendered unclean by contact; and *per contra* what things may be kept pure and clean by avoiding this contact. And so also what diseases are to be especially watched lest such contact and uncleanness should be incurred and disease thereby spread. To non-professional minds the great minuteness with which the subject has been treated, and the number of things to be avoided lest soiling may occur; and the number of repetitions of the washings and isolations may appear excessively and foolishly minute. To the enlightened modern sanitarian these parts of the Sinaitic law read like so many warnings and hints, and the

outlines of sanitary teaching both suggestive and far-reaching, which has unwisely been too long neglected, to our racial detriment and disaster; and in which lay unnoticed for centuries the germ thought of the greatest and most beneficent of all modern secular medical discoveries.

Few things strike readers of the Pentateuch more forcibly than the frequency with which compulsory ablutions and washings were inculcated on the early Hebrews in all the numerous circumstances and conditions of life, so as almost to make them appear an unusually pure and physically clean nation. These implicated not only the individual bodies, clothing, household, &c.; but applied to their neighbours, streets, camp, and even to their worship and Tabernacle. So many things and circumstances and conditions of body, social and public and religous life, rendered a Hebrew ceremonially unclean, that they must each have been frequently compelled to wash hands or body every day. How often it would of course be impossible to compute; and this in addition to the reasonable demands for ordinary cleanliness. To give instances would be unnecessary; as they are so abundant; and better read in the original text. And it is mainly necessary to observe here, that from these ablutions none were excused. They not only applied to the community, but also to their leaders, civil and sacerdotal, to Moses, Aaron, the Priests and Levites. Indeed the greatest restrictions fell on these. These were model men and exemplars.

Private is the basis of public cleanliness. A little thought will shew the detrimental effect of personal uncleanness in a camp or community like that of the Hebrews of the Wanderings; especially its communicability and tendency to cause both private household and also public detriment. Thus a personally unclean individual who neglects the purity of his hands, feet, skin, head, &c., soils thereby his bedding, clothing, and all he touches. If he ails this besoiling is largely increased by his bodily excretions. If the ailment is infectious, he spreads the venom to others far more than a more cleanly person would. So again, a dirty cook may contaminate all that he or she touches; and may thus disseminate disease. So, too, a dirty housemaid may soil all she touches in an otherwise clean dwelling. A dirty dairymaid may contaminate the milk, butter, cheese, &c. And so of all other occupations, conditions in life, and trades. Thus, in addition to the bad example of unclean habits these persons set to others, they may themselves directly originate and spread disease far and wide by their unhygienic ways. An untidy servant or housemaid of careless habits may, by throwing contaminated water to filter into a neighbouring well or brook, thereby contaminate these and originate virulent disease to spread over a village or district, country or continent.

For in contagious and infectious disease the direst epidemic and pandemic scourges oft originate in the smallest of beginnings in some isolated household or some unimportant individual in it. Clearly by inculcating these facts and what dire disasters may follow their disobedience, erring individuals will be less likely to err a second time. So the Mosaic laws of cleanliness were first and mainly inculcated on individuals and the common people. The education of the masses in hygienic truths and sanitary ways is not an easy task. And Jehovah knew that His hygienic, like all other great and fundamental Biblical truths, can only be clearly perceived and fully followed when their importance is learnt. And this plane is only reached by frequent reiteration of facts in different ways and under many different conditions; as with the Mosaic hygiene.

The Holy Scriptures were thus the first to codify the great fundamental laws of cleanliness; and also to inferentially point out their true bearings and relation. The Sinaitic hygiene evidently recognised that the foundation stone and base fact of all hygiene; not only the physical but also the moral, social, mental and spiritual, is broadly and best expressed by the word cleanliness. The Bible was thus the first to recognise a fact which is now acknowledged to be one of the main axioms in modern hygiene. Nothing shews more effectually than the Mosaic hygiene how easily the human body, like all other sublunary things, becomes soiled, impure and unclean; the constant care necessary to avoid this; and inferentially the morbific results apt to flow from its disregard.

Ostensibly this complex ritual and these multiple laws of cleanliness of body, hands, feet, clothing, houses, &c., &c., were meant to encourage and enforce outward physical cleanliness and health. But no good Jew and no Gentile could for a moment suppose that this was their only object, or fail to see that they had another nobler ulterior end, outward purity being intended to symbolize, incite, and enforce inward purity, personal holiness, cleanliness of heart, soul, and conscience. So, conversely, no sane man can believe that the symbolic meaning was the sole reason for their enforcement, or that they had not a hygienic, health-giving, physiological and educational tendency and meaning; namely, the inculcation of personal domiciliary public and national cleanliness. Thus, in more senses than the one usually received may we not say with the Psalmist "that the law of the Lord is *perfect*; converting the soul: the testimony of the Lord is sure, making wise the simple" (Ps. xix. 7): and in it, and in this double law of cleanliness find a strong inducement for individual "meditation therein day and night" (Ps. i. 2); for in keeping of it there is a "great reward" (Ps. xix. 11).

Have these multiform Sinaitic laws concerning cleanliness

received full recognition or attention by humanity at large, for whom they were manifestly intended? Unprejudiced minds, both medical and lay, will agree that they are far from absurd, or shallow, obsolete, antiquated, adapted only for a primitive age, the Hebrews, or a desert life. Can there be a doubt that it is to the idea that these were one and all typical and ceremonial only, and therefore obsolete, that they have hitherto been so little recognised and left mainly to the exposition of Divines? Can anyone doubt that many, nay most of them, had an evident hygienic disease preventive aim as well as a typical one. Unquestionably one and perhaps the main object of the physical cleanliness was to inculcate purity of our higher nature. But medical men, aided by the light of modern research, will agree that much of it was also medico-hygienic and meant to aid health preservation and prevent disease. Excessive physical cleanliness is as important and necessary for the maintenance of our bodily health, as is moral, social, and spiritual purity for the salubrity of our higher nature. To make this idea regarding what is truly meant by "cleanliness" in the Mosaic law more apparent, the chief instances in the Sinaitic law enforcing various degrees and kinds of cleanliness have been tabulated (Table) to indicate clearly the occasions, penalties, and whether the High Priest, Priests, Levites, or Laity were implicated; and which of the cases were purely typical, and which had both a ceremonial and a medico-hygienic purpose. Personal cleanliness has always been regarded as a natural symbol of moral purity (Gen. xxxv. 2-3). Jehovah had not withheld his chief reason for now tabulating and inculcating these very minute, searching, and imperative laws regarding "cleanliness." For at the close of a lengthy chapter (Lev. xv.), consisting of special laws inculcating purity of the person, bedding, clothing, &c., of both sexes, particularly when afflicted with disease He gives the sum, substance, and practical aim of the whole, the condition alluded to being evidently twofold, not only actual but also symbolic, of soul as well as of body; by saying "Thus shall ye separate the Children of Israel from their uncleanness that they die not in it when they defile My Tabernacle that is among them" (Levit xv. 31). These rules indicated when the Hebrew laity were "impure" and unfit to worship the pure and holy God in His Tabernacle, from service in which they were "cut off" as long as they remained "unclean" physically, and far more morally, socially, and spiritually. The law of "cleanliness" was educational. 1st, the purely typical cleansings being meant to inculcate purity of our higher nature, especially the soul, purity which is psychical, being typified by physical cleanliness, even as the Holy Scriptures often employs the physical disease, leprosy, to typify the moral, social, and spiritual disease, sin.

2nd, the purely hygienic being meant to inculcate body sanitation as suggestive and promotive of the higher purity. 3rd, The combined typico-hygienic to inculcate both lessons by one law and observance and make the higher forms of cleanliness go hand in hand with the lower or material variety, and make them mutually provocative. Here, of course, we have nothing to do with the strictly legal or criminal portions of the Mosaic Code and their penalties; but only with the hygienic typico-hygienic and typical codes. Frequent use is made by the Deity of the law of physical cleanliness and its employment to educate the Hebrew mind in the higher intangible but far more momentous purity which should be Man's chief aim; and that is to be one of the chief characteristics of the future, when his better and everlasting entity is more evidently paramount. Moreover, both kinds of "cleanliness" thus inculcated and enforced, both the psychical and the physical has each a twofold or double aspect; and is both *preventive* of sin or of physical disease, and also curative of them.

To say that many of these Hebraic laws of "cleanliness" are not intentionally inculcative of physical purity, or in other words, educational of physical hygiene, is as great a mistake as to aver they were not tuitional of moral, social, and spiritual cleanliness, a point on which all agree. The typical part of the twin law was inculcative of soul and the hygienic of body purity. While legislating mainly for the health and purity of the Eternal soul, God thus included the care of the cleanliness and salubrity of the temporary body.

In the human mind there seems to be a natural and implanted connection between the thought of physical and that of psychological pollution. This correlation is probably even closer in warm than in temperate and cold climates. And hence doubtless the frequency of ablution in the religious rites of the East. Purification seems to be a fitting prelude to a continuance of our allegiance to God, and to a nearer approach to the Deity in worship. Ablution or bathing was common in most of the ancient nations as a preparation for prayer and sacrifice, or to expiate sin. The Egyptian Priests bathed twice by day and twice by night to fit them for their sacred offices. The Greeks and Romans bathed before sacrifices. The History of Israel abounded with illustrations (Gen. xxxv. 2; Ex. xix. 10; Lev. xvii. 13; Lev. xv.; Deut. xxiii. 10; Lev. xxii. 4-6; xvi. 26-28; Numb. xix. 10; John xi. 55). It was natural that the Jehovistic law should lay special stress on priestly purification (Ex. xxix. 4; xxx. 20; 2 Chron. iv. 2-6). Especially on the High Priest, whose consecration was preceded by washing, then unction, and lastly by sacrifice (Ex. xxix. 4; xl. 12-15; Lev. viii.). The spiritual and ceremonial significance of all these physical wash-

ings of priests and people was well known to the devout Israelites (Ps. xxvi. 67; li. 2; lxiii. 13; Is. i. 16; iv. 4; Jer. iv. 14; Zech. xiii. 1). Still modern medical knowledge has materially enlarged the significance of many but not all these rules, by shewing they might be and are something more than purely religious, devotional, and symbolic. They are also sanitary.

The following examples from the Table will shew the difference between the purely typical "cleanlinesses" and those which were typico-hygienic. When Aaron was installed as High Priest and his sons as Priests, and were *washed with water* in addition to other ceremonies, such as robing and anointing, their bodies and clothes were *washed* (Ex. xxix. 4; Lev. viii. 1-13). The High Priest had also to wash his hands each time before entering the Holy Place (Lev. xvi. 2, 3, 4): and also on the great annual day of atonement (Lev. xvi. 24). Before installation the Levites had to shave and wash their clothes and bodies (Numb. viii. 7). In these instances the physical purification was evidently wholly emblematic, inculcative, and typical of spiritual purity. As in later times, Apostolic purity was symbolized by washing with water (Ephes. v. 26). Nothing else could be imagined concerning their object. No one could ever deem them medico-hygienic or ordained for simple physical cleanliness in persons of rank and refinement; and they were not imposed for disease prevention or amelioration. But on the other hand the cleaning of the blood, flesh, and fire-soiled altar (Ex. xxix. 37); that of the oft-soiled Tabernacle and Temple, deemed important matters (2 Chron. xxix. 16), and neglect of it a source of regret (Dan. viii. 14); and the washing of the officiating priests' hands after sacrificing; were all instances in which the typical was blent with the sanitary and the prevention of disease from physical uncleanliness. And the same is the case with the laity, as when a Hebrew became "unclean" by touching a dead body (Numb. xix. 11), or even a human bone (Numb. xix. 11-16); for which sprinkling with the water of purification, isolation for seven days, and then purification by washing himself and his perchance disease-infected clothing. These precautions were clearly not only typical but something more. They were hygienic and preventive of disease. The modern physician knows what the Divine Hygeist and Law-giver knew then, and possibly his pupil Moses, but of what the Egyptians and Hebrew Priest-physicians were ignorant regarding micro-organisms, infection and contagion. Hence the rule did not apply to infected or contagious bodies or bones alone, but to all, thereby to reduce the danger to nil. By this simple incident of temporary contact, if the person or bone were infected, a dire epidemic might be initiated, the end of which, even from such a trivial beginning, might be disastrous and cost many lives. Physicians know how

easily epidemic and pandemic diseases originate: and that this might happen even from such an apparently unimportant incident as touching a healthy person with a very slightly soiled but contaminated and germ-laden finger. These were wise rules of a hygienic nature; because in those early days people were ignorant of the laws of contagion and even of that source of disease itself. As Jehovah has blent the soul and body so does he their education. Though separate and distinct, in a sense, these are materially interdependant entities. And no one knows better how to combine the education of both by one law and one observance, and to teach body and soul hygiene and cleanliness by a single enactment. The enactments regarding the "uncleanness" of disease and their penalties of ablution, isolation, &c., must be similarly viewed. No one can consider the washings which accompanied the isolation of a true or presumed leper, or one affected with an "issue," from his fellow creatures, as purely typical and ceremonial. Clearly they were very largely, though not altogether medico-hygienic, that is disease preventive and disease curative; especially those employed during the course of the disease. Whereas the ablutions which followed cure and release from isolation, and accompanied the expiatory sacrifices, were as clearly mainly typical and far less hygienic. The typical importance and meaning no doubt varied much in different cases; and so did the hygienic; and also the typico-hygienic.

It is altogether erroneous to suppose, as is sometimes done by non-professional minds, at least of the laity, that the washings and ablutions of the whole or of parts of the human body, as part of the Hebrew ceremonial law is altogether typical, and never anything else. This is to be regretted, as this is practically equivalent to deeming them obsolete, like the ceremonial law itself; and thus tantamount to ignoring and refusing Divine hygienic advice. And it is wise to realise that they were and are largely hygienic, and sometimes almost entirely so: and meant to inculcate the beauty and benefits and duty of cleanliness, the foundation of all sanitation. And in their combined or purely typical form to inculcate and enforce the higher hygiene, and purity of the heart and soul and morals. Extreme physical cleanliness is the basis and secret of all effective medical hygiene, whether surgical, medical, obstetric, or sanitary. Even as a "clean" or "pure" heart and soul is the basis and should be the aim of all moral and social hygiene and health; and soul purity, that of all spiritual health and hygiene. The Mosaic hygiene of cleanliness inculcated them all; shewed their interdependence; and correlation. And thus legislates in matters of "cleanliness" for the entire human being; for our body, morals, social life, and our soul. By imparting the laws

and the chief salient points and merits of physical hygiene, it teaches moral and spiritual hygiene likewise and vice-versa. While again all this extreme cleanliness and purity, typical and otherwise inculcated on so many occasions, could not fail to engender a liking and improved attention to physical cleanliness of body, clothes, &c., &c., pure and simple. This was no doubt highly necessary during the earlier years of the Wanderings, when the Hebrews were little else than degraded, lately emancipated, slaves. Later on the annoyance of their desert banishment would also conduce to uncleanly habits, which had to be combated: and was no doubt largely met thus.

It should also be noticed that these regulations regarding "cleanliness" are mostly doubly hygienic. For in most cases they each include and combine two most important sanitary factors; viz.—

1st. Washing with water to dilute and disperse uncleanly and perhaps morbific matter, chemical or bacteric.

2nd. Isolation to widely separate the sound from the ailing or "unclean," and thus prevent contamination.

How necessary, not only for comfort but for health and also for the avoidance of disease, these ablutions and cleansings and isolations were, still are, and always will be, both for Hebrews and Gentiles, and all mankind, during those frequent physiological or semi-pathological conditions, common to our race, is known to all medical men; and also how often these invaluable sanitary hints are evaded or minimized by the poorer classes. These Hebraic cleansings with which we have most to do, namely those with a typical basis but also a distinctly and strongly sanitary tendency, included cleansings and isolations: 1st, in conditions and circumstances which might *lead* to disease, such as touching a dead body; 2nd, in physiological conditions of body on the borderland of disease, *e.g.*, childbirth, periods, &c.; and 3rd, those where actual disease was present, such as leprosy, issues, &c.

And yet these cases, as a whole and individually, clearly inculcated not only physical but also ceremonial cleanliness; inasmuch as they taught and trained the mind imperceptibly to physical or body cleanliness, and to typical or moral and spiritual purity; that is to purity of the creature, servant, and offspring of the Being who is perfect purity; whose eye not only abhors physical uncleanness (Deut. xxiii. 14), but cannot even look on iniquity, moral, social, or spiritual; and who therefore, in his desire to reclaim Man, endeavours in this mode and by these complex laws of "cleanliness" to train His special people to see, feel, think, and act as He desires them, thus become a model in cleanliness and health matters appertaining thereto, for all the world then and subsequently to follow.

The laws for cleanliness were not codified to enforce that hygienic factor on other people—that is on their neighbours; but each and all for application on the individual Hebrew's own body, his clothing, property, &c. Nor were they of occasional and rare application; because many, if not every one of the instances legislated for must have happened very often in a lifetime, even in a single year, the total number of washings and isolations, and the obligations there anent must have been enormous. Jehovah's method of educating the grown Israelites resembled our own for children. With these it is only by frequent and compulsory repetition that the idea of extreme and constant cleanliness could be so deeply inculcated that it became established as a fixed habit and a pleasant duty.

The washings were mainly of the whole body and its immediate coverings, the clothing, which receives and often unduly retains some of the most noxious bodily excretions. Nor can any medical or unbiassed lay mind fail to see that these rules are mainly not typical only or chiefly but largely and often nearly entirely cleanly and thus sanitary. Or that they are practically unavoidable for persons with the slightest pretensions to cleanliness. This is especially true of those laws during sickness and ordinary physiological conditions; though apt, especially then, to be neglected by persons of uncleanly habits; as some, perhaps many of the abject, ignorant, and careless Hebrews, lately enslaved brick-makers of Egypt, doubtless had become during and by long and severe degradation. In every case the washing with water was ordained to follow a period of isolation or separation of the "unclean" person from the "clean" family circle or camp—that is the community at large. This isolation lasted from 1 to 7 days; and in more obstinate cases of disease, such as issue, until cured. In leprosy the cleansing was compulsory during the period of suspicion and isolation. But doubtless "cleansing" formed an important part of the treatment of the fully developed, permanently isolated, and incurable disease. Moreover, although these laws more particularly enforced body cleanliness, and that which chiefly causes or leads to contamination, its exterior, they are generally combined, and for obvious reasons, with washing of the clothing, &c. Because it would be not only a waste of time but also sanitarily useless or next to it, to wash the contaminated body, and leave it to be re-contaminated by the unclean clothing. At the same time the reverse holds good. So that it is wise and indeed necessary for both body and clothing to be thoroughly cleansed together. Purity and cleanliness of the clothing was as strictly enforced by Sinaitic precept as body cleanliness. The two were usually allied. Both were not only typical, but also and largely hygienic and disease

avoiding (Ex. xix. 10-14; Gen. xxv. 2). This was a most important law, as the Israelites often slept in their day clothing, or made only a slight change (Ex. xxii. 26-27). Cleanliness of the clothing, bedding, &c., as well as that of the body and skin are especially necessary and more incumbent during illness than in health is obvious; and hence why this was enforced by the Sinaitic Code (Lev. v.). Isolation was usually enforced with "cleanliness" and washing during disease; a factor both of typical and hygienic importance (See Part 3, Chap. 1). Like other Mosaic hygienic laws of "cleanliness" those made for disease were compulsory not only on the laity but on their leaders and Priests and Levites (Lev. xxii. 4-6). And it was the duty of the Levites not only to see the law enforced among the people but also to obey it themselves (Deut. xxiv. 7-8). Superlative cleanliness, physical and psychical, on which the Mosaic Code lavishes so much attention is the foundation and copestone of all hygiene, individual, communal, and racial. Hence why it is made the base fact of the Sinaitic Hygiene of Jehovah; why its items are so minutely and so often entered into, and why so rigidly enforced. They were not only followed but also read, taught, and enforced by the Priests and leaders. So that the Hebrews could not say they were meant only for the lower classes. No one could plead ignorance: and the penalties for disobedience would prevent evasion. In these respects the Hebrew laity and poor were clearly in advance of modern times and civilized countries in sanitary knowledge of this great factor of health and happiness.

It is with physical "uncleanness," both in health and disease, as it is with sin. It is only by repeated teaching and frequent re-iteration and forced inculcation of rules and such codified laws as those of the Sinaitic Hygiene, that the human mind, especially among the lower classes, that the ignorant, obstinate, and careless orders, can be taught to see what is right; and brought to acknowledge the disadvantages, dangers, and discomforts of neglect of sanitary rules like those of the Supreme; and the many and great benefits that flow from the reverse. In both matters, regarding physical cleanliness and mental, moral, social, and spiritual: Divines and Doctors preach and teach long in vain; what the Bible has been so long and emphatically inculcating almost unnoticed or oft altogether unknown.

The Sinaitic laws for superlative physical and physiological cleanliness thus not only very much antedate but even in some items yet surpass our modern sanitary ones. Moreover, their rules for cleanliness are applicable not only to the human body and its many organs and functions; but also to all that they and it absorbs; the food, drink, and air, but also to the clothing, bedding, tents, houses, household gear, streets, churches, and

all that Man has to deal with; but still more to the cleanliness not only of Man's lower nature and body but also of the immaterial soul which inhabits it, and of the morals and social life. In short, it includes cleanliness of the entire human being: and these laws of Sinai are only the eternal, unalterable, and perfect laws of Nature codified and formulated by Jehovah: given here and forming part of the Sinaitic Code with a view to supplement, increase the value and import of the spiritual, moral, and social laws of the Decalogue: and necessary to complete the series of health laws for our many-sided human entity. There can be little doubt that this watchful and scrupulous care, not in one but in every matter, and the avoidance of every kind of defilement, of body and soul, physical and typical has contributed largely towards and aided other potent sanitary factors prominent in that practical and efficacious Sinaitic sanitary code to keep the progeny of Abraham, strong, healthy, long-lived, perpetualized, and free from diseases of degeneracy, and many others that have afflicted other less fortunate sections of the human race.

The distinctive and main feature in the Mosaic ritual for "uncleanness" and "purification" is its expiatory or sin-atoning character. But clearly its hygienic bearing must not be forgotten or overlooked. The idea of human uncleanness is not specially Hebraic. The Mohammedans paid great attention to personal cleanliness. The Greeks attached it to the events of childbirth and death. Various nations did to the case of sexual intercourse. But with these simple ablution only was demanded. It was purely or mainly sanitary; and so far wise. The Hebrews alone were taught by isolation and expiatory offerings to discern fully the connection between the outward sign and the inward fount of impurity. And in the case of possible or actual disease they were instructed to know what it was they desired to prevent. The scriptural text "wash and be clean" (2 Kings v. 13; Is. i. 16), though of a date subsequent to the Hebrews of the Wanderings, expresses and combines not only the idea of soul expiation and renewed purity, but also that of the less important body hygiene and personal physical cleanliness: it also shews that cleanliness is not only next to but is something more and indeed an integral part of Godliness, as it includes the entire human being, soul as well as body: and it also shews that slovenly dirty habits of body are no adjunct of religion, but an insult and opposed to it. Sanctity has nothing whatever to do with self-neglect and insanitary conditions; but abhors them.

"Clean" and "unclean" are two of the chief typical and ceremonial words of the Holy Scriptures; and are especially prominent in the Sinaitic law. They are terms which are

applied not only to individuals but also to garments, houses, tents, utensils, &c. And, as the Hebrew Church, its ceremonial and worship have all been annulled by Christ and superseded by the Christian dispensation, it is round these words and the physical punitive acts to which they apply that the question revolves, are the whole of the laws to which cleanness and uncleanness are applied, and the penalties attached to their infraction annulled also? Unquestionably the purely typical part, aim, and object of these laws was then and thus abrogated. No one is now isolated from their home or city or is he compelled to wash his clothes or body for touching a corpse, a bone, or carcase of any animal, even a Hebraically unclean one, for no animal is now unclean (Acts x. 15; xi. 9); and so on throughout the appended Table. This purely ceremonial part of the law has truly been done away with. But the law was unmistakeably *sanitary* as well as typical. And the individual who now touches a dead body for example would for several sanitary reasons do well to wash his hands, perhaps his clothing, and perchance isolate himself from others. If certain the body was infectious would it not be wise and just to do so? So, too, would it if the thing touched were only a putrid bone or dead carcase; and for similar sanitary reasons. And in most if not all of the other instances of Hebrew "uncleanness" which involved penalties. They not only cleanse and tend to prevent infection at the time; but also silently inculcate and invite to cleanly habits, and ways of living which it is scarcely possible to overrate the importance of in health and comfort maintenance, and the warding off of disease. As regards the uncleannesses of disease and their penalties, although we do not isolate so often or so much in certain diseases and physiological conditions as in Mosaic days, the importance of cleanliness of the person, hair, head, hands, feet, clothing, houses, bedding, &c., cannot be too highly lauded; nor can they be too closely followed still, not only in these but in all diseases; seeing that uncleanly conditions are among the most potent health opponents and disease aids. No medical man would advocate their annulment either in the hygiene and treatment of disease or in the care and conduct of health. The strictly typical and ceremonial part and meaning of these cleansings has been annulled and is no longer binding. But the sanitary part has not and never can be. This still holds good; and is wise to follow, seeing that no one, even medical minds, can aver that these Sinaitic laws, though ancient in time and in human eyes, are antiquated; but, on the contrary, are perennial and supremely wise and judicious; and are in fact the eternal laws of the hygiene of cleanliness, codified by the highest and best of sanitarians, Him whose every law is "perfect" (Ps. xix. 7;

Ps. cxix. 96; xcii. 5); therefore cannot be surpassed, and which it is our highest wisdom to accept and obey.

Who can doubt that these circumstances of accident, necessity, or disease that come under the category of "uncleanness," physical or physiological or pathological, are as frequent now as in Mosaic times; nay, more common in proportion to the increase in the Earth's population; more common even as to the increase in the modern number of Jews? The penalties, sanitary and hygienically educational, are even more necessary now, both in health and during these semi-pathological or diseased states (Part 3). Jehovah, in His great scheme of world education and human redemption and elevation, takes away the typical nature of these laws; but the hygienic meaning and law remains permanent for the human frame when so circumstanced, physiologically or pathologically. Moreover, the hygiene of those intangible parts and functions in Man which the physical "cleanliness" was meant to typify, and for which these laws of cleanliness were only partly formulated, is not and never shall be annulled, being as and even more important and necessary than the physical. The hygiene and cleanliness of the heart, thoughts, morals, social life, and the soul, all incorporated and blent with those of the body, are as important as they ever were; and attention to these should be the greatest aim of every human life; for on these depends the proper fulfilment of the mission and rôle each was placed here to perform; and the manner in which we individually love, serve, obey, honour and glorify God while resident here; and largely our chance of attaining the future bliss for which we all long, pray, and strive for. The study and pursuit of physical cleanliness is the first step that leads to the far more important investigation and acceptance of those which appertain to our higher nature found elsewhere (Part 2, Chap. 12, 13, 14).

TABLE XI

Mosaic "Uncleanness" and its Penalties

AA

No.	Text.	Occasion.	Isolation Duration.	Washing.			Clothing.			Various.	Reason.	
				Body.	Hands.	Feet.	Washing.	Burning.	Destroying.		Typical only.	Typical Hygiene.
	Of the Laity. Public.											
1	Numb. xxxi. 19	Soldierly Disobedience	7 days	3 & 7 day			3 & 7 day					x
2	Lev. xvi. 14-16	Day of Atonement	once yearly	Sprinkling blood of mercy seat and altar.			bullock and goat. Scape goat			at on the freed	x	
3	Exod. xix. 15	Delivery of Decalogue	once				x				x	
	Of the Laity. Private.											
4	Lev. viii. 31 Deut. iv. 4	Eating "Unclean" animals	Till even									x
5	Deut. xiv. 21	Eating any animal died of itself	,,	May give to stranger or sell to alien								x
6	Lev. xi 8-31	Touching carcass of unclean animal	,,				x					x
7	Lev. viii. 32	Raiment, skins, sacks, vessels, &c., touched by unclean animal carcass	,,				x	earthen things		destroyed		x
8	Lev. viii. 34	Meat or Drink in vessel unclean from unclean carcass	,,									x
9	Lev. viii. 34	Things touched by unclean carcass	,,				oven and ranges		broken	down		x
10	Lev. viii. 36	Running water or fountain immediately contaminated by unclean carcass	,,	The rest of water "clean"								x
11	Lev. viii. 38	Damp seed contaminated by carcass of unclean animal	,,	The dry part clean								x

TABLE XI—Continued

Mosaic "Uncleanness" and its Penalties

No.	Text.	Occasion.	Isolation Duration.	Washing.			Clothing.			Various.	Reason.	
				Body.	Hands.	Feet	Washing.	Burning.	Destroying.		Typical only.	Typical Hygiene.
12	Lev. viii. 39	Touching carcass of clean animal died of itself	Till even									x
13	Lev. viii. 40	Eating ,, ,,	,,				x					x
	Lev. xvii. 15											
14	Lev. viii. 40	Carrying ,, ,,	,,				x					x
15	Lev. xvii. 14	Eating blood								Cut off		x
16	Lev. xvii. 14	Eating flesh with blood in it								,,		x
17	Lev. xvii. 15	,, torn with beasts	,,	x			x					x
18	Lev xvii. 3	Offering Sacrifice in Camp not in Tabernacle								Cut off		x
19	Lev. xviii.	Unlawful marriages and lusts								,,		x
20	Lev. xix 5	Eating peace off sacrifice on 3rd day								,,		x
21	Numb. vi. 9	Nazarite accident unclean by dead		Shave	head & 7 day							x
22	Numb. xix. 11	Touching human corpse	7 days	x & water	on 7th day r of separation		x on	7th day	out of camp			x
23	Numb. xix. 14	All entering tent with dead body	,,	x on	7th day ditto		x	ditto		,,		x
24	Numb. xix. 15	All things in such a tent	,,	On 7th day			wate r day a	of separa nd put o	tion 3 d ut of ca	ay & 7 mp		x
25	Numb. xix. 16	All open vessels in ditto	,,	,,			,,	,,				x
26	,, ,,	All touching slain by sword in field	,,	,,			,,	,,				x
27	,, ,,	All who touch a human bone	,,	,,			,,	,,				x
28	,, ,,	,, ,, grave	,,	,,			,,	,,				x
29	Numb xix 22	Whatever touches an unclean person	Till even									x
30	Deut. xxi. 6	Expiation of uncertain murder			x	elders	over be	headed	heifer		x	

	Of the Priesthood.											
31	Lev. viii. 21 Lev. ix. 14.	Priestly installation, ram for burnt offering, bull for sin offering		Parts	washed		parts	burnt			x	
32	Exod. xxx. 21 Exod. xl 32	Aaron and sons after sacrifice	Each time		x	x						x
33	Exod. xxx. 19	,, ,, on entering Holy Place	,,		x	x					x	
34	Exod. xxix. 4 Exod. xl. 13	,, ,, on consecration	Once	x							x	
35	Lev. xvi. 5	High Priest day of atonement before putting on his garments, 10th day 7th month	Yearly	x							x	
36	Lev. xvi. 23	High Priest ditto after disrobing	,,	x							x	
37	Lev. xvi. 26	Priest who lets scape goat go	,,	x			x					x
38	Lev. xvi. 28	Priest or Levite who burns remains of bull and goat beyond camp	,,	x			x					x
49	Lev. xxii. 3	Unclean H. Priest or Priest serving in Tabernacle								Cut off		x
40	Lev. xxii. 4	High Priest or Priest with leprosy	While ill									x
31	,, ,,	,, ,, running issue	,,							not eat Holy things		x
42	,, ,,	,, ,, touching anything unclean by disease	Till even	x						,,		x
43	Lev. xxii. 5	,, ,, after emission	,,	x						,,		x
44	,, ,,	,, ,, touching creeping things	,,	x						,,		x
45	,, ,,	,, ,, touching unclean man	,,	x						,,		x
46	Lev. xxii. 8	,, ,, eat what died of itself								Death		x
47	,, ,,	,, ,, eating animal torn with beasts								,,		x
48	Numb. viii. 5	Levites on installation					x	Shave flesh and sprinkle water of purification			x	
49	Numb. xix. 7	After slaying of red heifer for water of purification	Till even	x			x				x	
50	Numb. xix. 8	Burner of red heifer	,,	x			x				x	
51	Numb. xix. 10	Gatherer of ashes of red heifer	,,				x				x	

TABLE XI—Continued

Mosaic "Uncleanness" and its Penalties

No.	Text.	Occasion.	Isolation Duration.	Washing.			Clothing.			Various.	Reason.	
				Body.	Hands.	Feet.	Washing.	Burning.	Destroying.		Typical only.	Typical Hygiene.
	Of Disease and Physiological Conditions.											
52	Lev. xii. 2	Childbirth (male)	7 days 33 ,,									x
53	Lev. xii. 5	,, (female)	14 days 66 ,,									x
54	Lev. xiii. & xiv. Numb. lii.	Leprosy (doubtful)	7 days each	x			x			Shave hair		x
55	,, ,,	,, (confirmed)	Till cured out of camp	Head Cry	bared, Uncle	upper lip cove an, un clean		red	rent			x
56	,, ,,	,, garment (wool hair skin)	7 day periods					x				x
57	,, ,,	,, ,, (doubtful)	,,				x	Leprous x if	part torn out true		or	x
58	Lev. xiv. 35	House leprosy (suspected)	,,	Remo	ve lepr	ous sto nes out and re plaster		of camp,	replace			x
59	Lev. xiv. 45	,, (true)	Perpetual	Des	troy a	nd rem ove						x
60	Lev. xiv. 46	,, persons entering	Till even									x
61	Lev. xiv. 47	,, lying or eating in a	,,				x					x
62	Lev. xv. 2 Numb v 2	Running issue	Till cured							out of camp		x
63	Lev. xv. 13	,, (cured)	7 days		x		x					x
64	Lev. xv. 4	,, (bed)	Unclean									x

65	Lev. xv. 6	,,	person touching	Till even	x			x				x
66	,, ,,	,,	seat or sitter on it	,,	x			x				x
67	Lev. xv. 7	,,	touching his flesh	,,	x			x				x
68	Lev. xv. 8	,,	one spat on by	,,	x			x				x
69	Lev. xv. 10	,,	saddle sat on by	Unclean								x
70	,, ,,	,,	toucher of anything under	Till even	x			x				x
71	,, ,,	,,	bearer of things of	,,	x			x				x
72	Lev. xv. 11	,,	anyone touched by	,,	x			x				x
73	Lev. xv. 12	,,	earthen vessel touched by							broken		x
74	,, ,,	,,	wooden vessel touched by							rinsed in water		x
75	Lev. xv. 16	Male Pollutions		Till even	x							x
76	Deut. xxiii. 11	,,	soldiers in camp	,,	x					out of camp		x
77	Lev. xv. 17	,,	soiled garments	,,				x				x
78	Lev. xv. 18	Male and female conjunction		,,	x							x
79	Lev. xv. 19	Female issue (blood)		7 days								x
80	,, ,,	,,	all touching her	Till even								x
81	Lev. xv. 20	,,	all she lies or sits on	Till well								x
82	Lev. xv. 21	,,	all who touch her bed	Till even	x			x				x
83	Lev. xv. 22	,,	all touching she sat on	,,	x			x				x
84	Lev. xv. 23	,,	touching ought on bed or seat	,,								x
85	Lev. xv. 24	,,	male intercourse during	7 days								x
86	,, ,,	,,	,, (bed)	,,								x
87	Lev. xv. 25	Menorrhagia or metorrhagia		While ill								x
88	Lev. xv. 28	,,	,, cured	7 days								x
89	Lev. xv. 26	,,	,, her bed	,,								x
90	,, ,,	,,	,, what sits on	,,								x
91	Lev. xv. 27	,,	toucher of bed or seat	Till even	x							x
92	Deut. xxiii. 14	Defecation								out of camp cover up		x

This table, in which the many different forms of "uncleanness" according to the Sinaitic law, scattered through the Pentateuch are brought together, renders it abundantly apparent that these occasions were very frequent and universal. So much so that each day many out of that huge multitude of over two millions of souls would be "unclean" in some degree; and, if not isolated out of the camp would be in their tent or vicinity; and also bound to wash their bodies partly or wholly; and mayhap their garments, &c., &c. Thus was "cleanliness" brought home to and inculcated on every individual; and that not by their leader, or their priesthood or princes, whom they might disobey, but by their Maker, Keeper, and Guide, whom they feared. Thus was "uncleanness" deprecated and opposed. Thus were cleanly habits instilled and enforced; not only as a duty but as a pleasure and boon: not only to promote health, but also to foster morality and holiness: purity in body, morals, social life and soul. One or other, and often all together, were taught by the same lesson; and permanently fixed in the mind, conscience and habits of the recipient by constant repetition. The law, the faults, and penalties were ever before them: the wisdom of doing of certain things to avoid "uncleanness" and its penalty: and the doing of the reverse and obeying the law strictly, so as to preserve liberty and keep "clean." Two great lessons, namely strict obedience and perfect cleanliness, were thus daily, hourly, inculcated by one and the same lesson all over the Hebrew camp; on leader and laity alike; on Priest and people; on men, women, and children; on Hebrews and aliens. All these were taught not with a hidden and obscure but with a known object; one of beneficence and love; its aim being the health of their bodies and souls; their individual, family, tribal, and national vigour, welfare, and prosperity. The whole series of strictly enforced enactments and curtly codified laws was a superb method worthy of Divinity of winning and teaching the sanitation of cleanliness, not of body alone but in and of all things, both for duty and for interest.

The gift of this hygienic knowledge by Jehovah, as a most important part of the Sinaitic Code, was necessary, thoughtful, and well-timed: and of especial value in this early age, ignorant both of sanitary matters and their importance, especially of the vast import of this, the most potent and leading factor in the whole armamentarium of hygiene. These, moreover, were the first years and pupillage of a nation of degraded, unruly, ignorant, no doubt dirtily inclined, lately emancipated, brick-making, canal-digging, city-building serfs; many of whom had to be taught everything, and chiefly to rule themselves and obey God. It was necessary for a nation meant to be made and kept especially healthy not only for itself; but for a model in sanita-

tion to cotemporary and succeeding peoples. It was necessary for a selected race on which the love, care, and power of their great leader, Jehovah, would be seen as much in their extreme vigour and salubrity as in their worldly prosperity and anything else that might be adduced to prove supernal care, leading, and light in practical and theoretical matters; sanitary as well as in all else that appertains to the conduct and outcome of human life. This sanitation was compulsory on the Jews in their national and hygienically-ignorant infancy. It is voluntary on us in modern times, to a great extent; because enlightened nations and individuals have learnt to know and appreciate its value and can be more safely left to follow it of their own accord.

The following table, an epitome of the preceding, shews the frequency, nature, and relation of the laws of Hebrew "cleanliness" to classes. This proves that of the 92 times where "cleanliness" is spoken of and legislated for, in other words, taught and enforced, and "uncleanness" corrected or prevented by Sinaitic, that is Jehovistic enactments, three concerned the laity as a whole, and were thus of a *public* nature.

TABLE XII (epitomising Table XI)
of Cleanlines in its Nature and Relation to *Classes*

For whom.	Typical only.	Typical & Hygiene.	Total.
Public - -	2	1	3
Individuals -	1	26	27
Priesthood -	9	12	21
Disease - -	0	41	41
Total - -	12	80	92

Two of these were typical only. Again 27 concerned the laity as individuals, of which 1 was typical only, and 26 both typical and hygienic. Moreover, of the 21 which concerned the Priesthood and Levites 9 were typical only and 12 typo-hygienic. The largest numbers concerned disease and physiological conditions, namely 41. Of these none were typical only, and all were typo-hygienic. These latter have been spoken of in this place instead of the chapter on the hygiene of disease; so that the entire subject of "cleanliness" might be seen and studied at a glance. The number of observances and rules for the cleanliness of the Priesthood and Levites, viz., 21 in 92 or

1 in $3\frac{1}{3}$, who were only a comparatively small part of the vast host, is noteworthy. There were 603,550 Hebrew males over 21 and 22,273 Priests and Levites at the numbering at Sinai, *i.e.*, one of the latter to 27 of the former. This legal strictness for the Tabernacle staff tended to preserve and increase the Hebrew reverence for God's holiness; the Hebrew individual holiness, by impressing the laity with a due respect for both. To make the better class, their teachers and examplars, especially cleanly and orderly, was one of the best methods of impressing the lesson on the people. Had this been only or mostly compulsory on the public, not on the Levites, murmuring might have ensued and disobedience. Moreover, disobedience to the decision of the Priest or judge regarding these portions of the law was not forgiven or commutable, but punished by death. This sentence was inexorable. In carrying it out the Priests were Jehovah's deputies and "servants." Their duty was to digest, learn, and enforce, not their own but His commands. Their "orders" were "whatsoever thing I command you observe to do it: thou shalt not add thereto nor diminish from it (Deut. xii. 32). Jehovah does not legislate unwisely or lightly. His every legislation and law and item in it is of supreme importance and imperative: as were the many regarding "cleanliness" and cleanly habits, private and public.

Post-Mosaic and Christian Cleanliness

Scattered through the historical and prophetic books of the Old Testament, we find the infinite importance and imperative necessity of cleanliness and purity spoken of in very strong terms; and both in the purely figurative and in the typo-hygienic forms; the former alluding only to soul purity, and the latter where physical cleanliness is spoken of as the type of the higher cleanliness, both physical and spiritual cleanliness being suggested and inculcated. Here also the same types and language and inferences are employed as in Mosaic days. For although cleanliness and purity of soul, morals, and social life are spoken of thus in typical language, this is done simply to suit the limited and narrow human comprehension of that day, mainly accustomed to tangible physical things, and all unfamiliar with such intangible entities, forces, and laws as appertain to spiritual things and realms. Purity or impurity of the soul, morals, and home were and are not only real conditions and aspirations, but are such as all wise and God-fearing individuals will aim at or shun, as among the greatest desires of their lives and a convincing proof to the world of true Godliness. Unclean, impure, filthy morals, hearts, social lives and souls, even though unseen to others, should be acknowledged, felt, and

mayhap deplored by individuals as sad and real conditions, of far deeper import and danger than the visible, tangible, uncleannesses of body, face, hands, and feet, which we remove by washing. Both kinds of cleanness, the physical and the spiritual, are absolutely necessary for the health, happiness, and welfare of humanity, individually and collectively. Hence both are legislated for and inculcated often by one and the same law: the spiritual purity which includes the moral and social being aided and taught by the typical, physical sacrifices and other penalties of the Sinaitic Code as conditions necessary for Man's higher nature, and of far greater import than the physical cleanliness, washings, and purifications of the material body; and of less import, though still very necessary for our physical or bodily cleanliness, comfort, and health. Apposite examples of the purely typical allusions to washings and cleansings of the body in the post-Mosaic Bible writings are to be found in Psalms li. 2; li. 7. Of the hands in Ps. lxxiii. 13; of the feet in Cant. v. 3; of the heart in Jer. iv. 14; li. 10. On the other hand examples of the typo-physical cleansings of the body occur in Job xi. 4; ix. 30; xv. 14; xxxiii. 9; Is. i. 16; Ps. li. 7; xviii. 25; xix. 20; cxix. 9; lxxiii. 13; Neh. xiii. 22; Jer. xxxiii. 8. Of the hands in Job ix. 30; xvii. 9; Ps. xxiv. 4; xxvi. 6; lxxiii. 13. Of the feet in Ps. lviii. 10; Cant. v. 3. Of the heart in Ps. li. 10; xviii. 20; lxxiii. 1; Prov. xx. 9; 2 Sam. xxii. 21; Jer. iv. 14. Of the eyes, Cant. v. 12. In these the same types and expressions are employed as in earlier Mosaic days and the years of the Wanderings; with a view to promote the same ends; not only outward, physical, body cleanliness, but also inward purity of the heart, moral life and soul: and therefore tuitional of purity of the whole entity of Man, and educational both of his earthly and his eternal nature.

Later on, during the 33 years of the Messiah's life, the law in its entirety continued in full force, although His teaching was directed to forestall a radical change. So, in the four gospels, which give the main features and story of Christ's mission work, we find Him frequently alluding to cleanliness and washings and purity; and exemplifying them by practical application; wherein He sometimes employs physical processes to inculcate the higher purity which it was part of His great mission to teach. Sometimes His illustrations are purely typical. Thus of the body (John xiii. 10; xiii. 11; xv. 3; Mat. viii. 3). Of the feet (Luke vii. 44; John xiii. 8; xiii. 5). Of the face (Mat. vi. 17). But still oftener, as in Mosaic times, do they inculcate body purity, as typical of the higher cleanliness. The same types are employed as in Mosaic days; and with the same educational aim, but in an intensified form. Because the

Hebrews had already been long indoctrinated in the advantages and benefits of cleanly habits of body. Those of the typical kind, indicative of cleanliness of the heart, mind, morals, social life and soul, were now more prominent, and their surpassing import more clearly indicated (Mat. xvi. 26; Mark viii. 27). Personal cleanliness, however, is strongly commended, directly and indirectly, in the New Testament, that is in Messianic and Apostolic days; spoken of as a luxury; and to have opportunities for it as a great boon (Mat. x. 8; Luke xvii. 7). The necessity for complete ablution is clearly indicated (John xiii. 10); and also figuratively alluded to (Heb. x. 23), as it was in prophetic days (Ezek. xvi. 9). It was and still is in the East a mark of hospitality to permit hand and feet washing; and a personal slight to withhold it (Luke vii. 14). One of the highest marks of esteem was for a host to himself wash his friends or guests' feet (Luke vii. 38; John xiii. 5). The Pharisees never ate with unwashed hands (Mark vii. 6). This, although specially necessary for them, who ate with their fingers, is a very good hygienic rule for all climes and periods. Watson tells us that in Christ's time, as the Hebrew law enjoined ablutions after a person had touched anything ceremonially unclean (Lev. xv. 11) the excessive formalism of Jewish teachers had imposed this whenever there was the least possibility of defilement. Thus, on sitting down to meals the person rinsed his hands; and washed himself even more carefully after returning from the "market" or place of public concourse. Thorough ablution of cups, vases, brazen vessels, and dining couches was also required. The later Jews even directed that the framework of couches should be taken to pieces and dipped. By this punctilious washing, especially of the hands, the Pharisees distinguished themselves not only from the heathen, but also from "men of the earth" as they called the common people of their own nation. Cleanliness of the hair and nails was also inculcated to avoid scab and cutaneous eruptions, prevalent and stubborn. Washing the mouth after meals was necessary and wise, and for the same reason as hand ablution. The New Testament often indirectly and symbolically recommends clean clothing (Rev. vii. 14; xix. 8-14); and, as in the Old Testament, it is indirectly praised by contrasting it with filthy garments (Zech. iii. 3; 2 Sam. xix. 24). As in the Pentateuch, the New Testament encourages cleanliness of household utensils (Mark vii. 4). Church purity was symbolized in Apostolic times by washing with water (Ephes. v. 26). So also the removal of sin from Man is spoken of symbolically as a process of washing (1 John i. 7). Much of this is doubtless typical; but in these advanced days even non-medical minds will perceive how highly sanitary much of it, no doubt intentionally, was, and that this

hyper-cleanliness was well calculated to prevent disease entering our frames by many possible channels—the skin, food, clothing, mouth, drink, furniture, bedding, &c., &c. Ordinary dust, wherever deposited, often contains morbid, microscopic germs and of many diseases; which may clearly be prevented by its timely removal and destruction.

Those final episodes of the Saviour's life, His death, and resurrection completed what He had come to effect, the induction of another phase in God's plan of human salvation: the advancement of the world's education to a higher and more developed plane: and the substitution of a renovated and more spiritual Church and Dispensation, the Christian; with Him as its head for that of types, ceremonies, and sacrifices, the Mosaic. Of these two Churches, the old and the new, the following are the chief distinctive features:—

Christian Dispensation.	Mosaic Dispensation.
One sacrifice for all sin.	One for each transgression.
Victim the God-man Christ.	An animal.
The blood shed human.	Animal.
Victim sacrificed voluntarily.	Compulsorily.
Acceptance by the sacrificer Voluntary.	Compulsory.
Faith a primary and necessary factor.	A minor one.
Also the willing service of the body (Rom. xii. 1) and heart (Heb. x. 22) and mind (2 Chron. viii. 12) and soul (Luke x. 27).	Ditto.
The sinner washed in blood long shed.	In priest shed blood.
Christ the H. Priest spiritually present.	H. Priest present in body.
Obedience from Love and Faith.	From awe and fear.

The leading idea in the new Church, and God's desire and attitude regarding sacrifice are well expressed in the Old Testament of post-Mosaic times; especially in Ps. 50 7-15; li. 17; and Isaiah i. 13-20; which shewed that these Hebrew sacrifices were too often far from accomplishing all that Jehovah desired and expected by way of inward reformation and soul purification.

By the Christian dispensation the sacrifice of animals, vegetable produce, and incense have been annulled. God

desires not the blood of goats and bullocks, but the fealty and service of our bodies (Rom. i. 1); our souls (Mat. xxii. 37; Luke x. 27); and heart (Mark xii. 33; Heb. xiii. 16; Heb. xiii. 15); and the devotion and incense of our sanctified lives. And so both in the days of Christ and the Apostles we find they employed the old types to illustrate and enforce spiritual ideas and teachings. Among these are many by which physical necessaries and processes in and for the human frame are used to point out to willing receptive minds that corresponding though dissimilar things are required for our higher nature. Thus we read of *hungering* and *thirsting* after righteousness (Mat. v. 6); of the *bread* and *water* of life (John vi. 50; vi. 35; iv. 10); of the *washing* of regeneration (Tit. iii. 5); the spirit of *slumber* (Rom. xi. 8); *pouring* of the Holy Spirit (Joel ii. 28); and so forth; figures of speech, one and all indicative of the spiritual food, drink, and cleansings which are as necessary for our souls as the corresponding physical things are for our bodies, welfare, happiness, health, and even life; all of them real, but yet of a nature still as unknown to us as the soul itself is. Cleanliness of the soul, and that of the body likewise are as much required now as ever; and should be followed out not only for our own sakes, but because Jehovah has ordained them; and only by their pursuit can we have His blessing, commendation, and reward.

But while Christ's death and resurrection substituted a new Church, the Christian for the Hebrew, this did not annul the Mosaic or Hebrew law. On the contrary Christ tells us He came not to destroy but to endorse and fulfil the law of Moses (Mat. v. 7). Nor did He ever break Himself in the letter or spirit what He inculcated on others. In accordance with this the great laws for effecting cleanliness, purity, welfare, holiness, and just living for the human soul, morals, heart, and spiritual life, enshrined in the Decalogue or Ten Commandments, continue and will ever remain in full force; not only as Jehovah delivered them but as Jesus epitomized and crystallized them into two, love to God and to our fellow-men (Mat. v. 43). The political, poor law, criminal, commercial, and other codes of the Mosaic law, likewise remain and form the basis of all public, national, and racial purity and probity, as the foundation of all the wisest laws that Man has yet made for human government; laws modified to suit different times, circumstances, conditions, planes of thought, and grades of civilization. So also the laws of hygiene, which form so integral and important a part of the old Hebrew code, still remain in full force, as part of the eternal laws of creation; modified occasionally to suit new views and developments. Among these hygienic laws are those

of cleanliness spoken of here. These remain to encourage cleanliness and discourage uncleanness in terms framed with the general laws of hygiene and health preservation long before the Sinaitic promulgation; though all unstudied until the latter was given beneficently to Man in his ignorance, to help him to know the importance of and the methods by which he might keep not only his body but also his soul, mind, heart, as well as his houses, clothing, and other belongings, clean and pure. Laws intentionally outlined in the Mosaic code by the Deity Himself, and therefore as binding now as they ever were. As with other parts of the Mosaic code so with its hygiene; and so with the branch of this, cleanliness. Parts of it have been modified to suit modern developments. We, of modern times and Christian experience, who are fully alive to the sacredness of life and death and blood, no longer deem it necessary to wash and cleanse and isolate persons or things as the Hebrews did when a dead body or bone or grave was touched; or in other circumstances detailed in Table XI. But, fully aware as we are of the medical danger which surrounds and interpenetrates many such occasions and occurrences, and of the infinite importance of supreme and perfect physical purity and cleanliness, not only in these but in all things; we inculcate cleanliness and washings to obviate possible morbific contamination and disease, as well as common-sense, comfort, and wise cleanly tendencies. And we no longer make these compulsory, but voluntary. In this we no longer follow the Mosaic law, but are a law unto ourselves. Neither physical nor typical cleanliness; that of the body or soul were abolished by Christ, nor were the hygienic laws and forces which govern them. One of the chief outcomes of the new law of Christ was to teach the beauty, value, and imperative necessity for scrupulous cleanliness in every department of human life; in soul and body; in private and public; in the individual community and race; in the moral, social, and spiritual life; as the conduct alone pleasing and acceptable to God. Christ's teaching as to the importance of living clean and pure lives was far in advance of that whose test was closeness of obedience to the laws of Sinai. Mankind was now in a higher school; and abler to understand the deep and true aim of the Sinaitic inculcations regarding cleanliness, the education of the higher purity. By the Mosaic code strict obedience to the Commandment was enough. Christ taught a deeper purity, that even looking and lusting involved guilt. And so also with regard to other things. Christ completed the lesson which the Sinaitic code began. He substituted for the Hebrew Church and dispensation, in which enforced works led to greater faith, others on a higher level, in which voluntary faith is supplemented by works as its outcome;

and for physical sacrifice the best and most acceptable offerings that any individual can give to so All-seeing and All-knowing a God, a clean heart, a blood washed soul, a pure conscience void of offence, and unsullied love, worship, and fealty. And as with the Mosaic teachings, so His shew that nothing is more certain than this: that cleanness of the higher or inner life is a sure incentive to cleanness of the lower, outer, worldly, body existence; and to physico-hygienic purity of the person. Throughout the entire Holy Scriptures washing is the symbol expressive of cleanliness, and personal that of moral and spiritual purity (Is. i. 16; Ezek. xxxvi. 25; Ps. lxxiii. 13). And nowhere is purity and cleanliness of the entire Man, body and soul; of his whole life; and of all he does, says, and even thinks, better or more fully inculcated than in the best sermon ever preached, that by Christ on the Mount (Mat. v. 6-7); the Divine Sanitarian's epitome of hygiene for humanity.

To cotemporary nations these ostensibly Hebrew but really Divine rules and laws relating to cleanliness and purity in all things; endorsed in later times by the Christ, no doubt appeared somewhat absurd, frivolous, unnecessary, excessively minute, and mere "foolishness" (1 Cor. ii. 14): as they even may to many of the present-day who fail to realize their wide aim, or to see that they are hygienically rational and tuitional, not only of body cleanliness but also of the higher purity. Other causes may have contributed to this, and to their consequent neglect; for instance, their source, the ostracised Hebrew race; their object, temporary and special, connected with Hebrew education and worship, their ritual, nomadic life, and desert environment.

From a modern medical standpoint the laws of "cleanness" which thus form an important item in the teaching of the ancient Hebrew and the modern Christian Church, and are found in the text of the Old and the New Testaments, were the wisest and best modes that could have been devised for inculcating the human hygiene of cleanliness in its entirety and for the whole Man. Because it taught body or physical cleanliness by associating and incorporating and making its pursuit a part of religious duty, ceremonies, and religion itself, and part of a complex ritual that overshadowed and interpenetrated the Hebrew life; the ultimate aim of which was to engender purity of Man's higher nature, and inculcate soul, moral, and social hygiene: the former or physical hygiene thus leading up to and promoting the higher hygiene; and again the latter the former. No other preaching or teaching could have taught the Hebrews better. Nor can anything point out better, even to us, the facility and frequency with which the human being becomes soiled, unclean, or impure, both externally, by physical con-

tamination, and internally by mental, moral, and spiritual soiling; than the exceedingly minute and stringent rules for the regulation and furtherance of human cleanliness, which formed an integral and important part of the Sinaitic code, shewing how to best preserve the human frame and its invaluable tenant from pollution and the possible result of this, disease.

Cleanliness is clearly of as much and often of more importance in modern times than in Mosaic and even Messianic days to the Hebrews. Our enlightenment and Christianity make us even more anxious to preserve health and avoid disease. Their bodies, tents, houses, furniture, clothing, and so forth, were less apt to get defiled than ours now are, by smoke polluted atmospheres, dusty streets, and dirty trades, as well as the many insanitary factors that spring from the close aggregation of human beings in communities. And their health laws regarding cleanliness, though not in a Hebrew sense binding on Gentiles; are still viewed broadly and as part of the laws of Nature, in their spirit and tenor, inculcative and of purity and cleanliness in all things, heart, mind, life, body, and soul; modified as they may sometimes be to suit localities, climates, environments, enlightenment, and the age in which we live; as well adapted to aid the maintenance of our health and preservation or prolongation of our lives as theirs. They are therefore worth study; to select what is still acceptable and worth imitation. Against nothing are medical men more strongly fighting at the present day, one of high hygienic ideals, than against uncleanness and unclean habits, private and public; and their disastrous sequel. One and all of them agree that this is eminently necessary. For, want of cleanliness is still far too prevalent even among civilized mankind, in all its worst forms. And there is no more frequent or potent disease factor or agent of death than this. The mental, moral, social, and spiritual aspects of cleanness and uncleanness, their results, and their hygiene, are spoken of in Chapters 12, 13 and 14, Part 2, as well as how these act and react on physical cleanness or impurity in health and in disease. The memorable petition, "Lord if thou wilt thou canst make me clean" (Mat. viii. 2) was a request of far wider import and outcome than the man, leper in soul as well as in body, knew when he made it. The wisest desire of every human being is or should be to be "clean every whit" (John xiii. 10), by the blood and aid of Him who uttered these words as one of the chief goals of our fallen race. Struggling hard as we are and all through life betwixt the two great sanitary opposing forces of earth, cleanness and uncleanness.

CHAPTER VIII

CLOTHING

"Wherewithal shall we be clothed" (Mat. vi. 31; Job. xxxi. 19).

Besides acting as a decorous covering, our clothing has an additional two-fold sanitary purpose; namely to keep the skin clean, and to protect the body from atmospheric vicissitudes, from the warmth of some and the cold of other climates, seasons, and weather changes.

The chief requirements of dress are, *first*, that it should permit full freedom of movement; *second*, that there should be absence of pressure on any part; *third*, that the clothing should be no heavier than necessary for warmth; *fourth*, that the weight and warmth should be equally distributed; and *fifthly*, that its beauty and grace should be combined with comfort and convenience.

Both comfort and health require that the body should be kept at a certain temperature. The normal heat of the human body averages about 98½° Fah. If this should at any time rise a few degrees above this medium, or fall a few degrees below it, danger to health or life is imminent. In order to effect this constant equability in the body temperature the fulfilment of certain conditions are necessary, as long since pointed out by the Holy Scriptures. These conditions referred especially, *first*, as to food (Ps. civ. 15); *second* subjection to artificial heat (Nah. iii. 17; Is. xlvii. 14; xliv. 16; Acts xxvi. 2; Mark xiv. 54; John xviii. 18; xxv. 67); *third*, as to artificial cold (Is. xxxii. 2); and *fourth* and chiefly as to varying the *clothing* (Job xxxi. 20; xxxvii. 7; Prov. xxv. 20). The requisite variation in the food has been spoken of in Chap. 2, Part 2; and variations of temperature in Chap. 11, Part 2. The variations in the clothing we are now about to consider.

It follows from what has been already said, that it is easy to make our dress unhygienic and unhealthy; that is disease-inducing and life-endangering. Facts moreover prove what theory suggests, namely that a much larger amount of sickness and many more deaths result from this cause, especially from *scanty* clothing and from the different varieties of what is usually termed a "cold"; for example in the head, throat, lungs,

and elsewhere; all more apt to result therefrom than is usually supposed. Now, in order to prevent these evils it is necessary to attend not only to the material, but also to the colour, quality, quantity, and pattern of our clothing.

The *material* of which our clothing is composed is a most important sanitary item. In cold regions, weather, or seasons, not only is it necessary to add to our clothing, but also wise to use different material, with non-conducting properties, for the double purpose of keeping in the heat of the body and excluding the cold of the external air. Whereas in summer it should consist of conducting material to quickly radiate the surplus bodily heat, and also that of the strong solar rays; thereby in both ways contributing to coolness. Experience has shewn that materials of a fibrous nature are bad conductors of heat; and also that the conductivity of the most familiar material of which our clothing or bedding is usually made lessens in the following order: hair, wool, feathers, down, silk, linen, cotton, raw silk, fur. From this it appears that hair and wool are the best, and raw silk and fur the worse conductors of heat. Also that cotton carries off heat faster than wool, and linen faster than either. Hence it follows that the most judicious *summer* clothing is that made of linen or cotton; and the best *winter* clothing of wool or fur; viewing the matter from a practical and hygienic point of view. The same facts hold good regarding the cold caused by change of latitude. In high parallels of the two temperate zones cotton and linen rank nearly equal as heat preservers; while wool is better in this respect than either, especially for underclothing. For the excessive cold of Arctic and Antarctic regions it is necessary to use thick woollens, furs, and waterproof. The material which best preserves the body from excessive heat is thin linen, cotton, and silk. But the desired result in this case depends more on colour than on texture or kind, except in one particular, namely absorbability. This has much to do with comfort and health in warm regions. Thus, wool is twice as absorbent, and therefore so much the more comfortable when perspiring than cotton or linen. Hence flannel or merino, which contains from 20 to 50 per cent. of cotton, is well adapted for tropical or warm regions.

The relative advantages and disadvantages of the different materials of modern clothing for different circumstances, atmospheres, and otherwise, may be briefly summed up thus:—

Cotton is a quicker conductor of the bodily heat than wool, and is therefore better in warm latitudes and seasons. It also absorbs less water, such as that of which the perspiration of the human skin chiefly consists: parts with it more readily; and is therefore more cooling than woollen in warm atmospheres.

Linen conducts the body heat quickly, and absorbs water

better than cotton; and hence is still better adapted for warm regions and sultry seasons.

Woollens, such as flannels, are the warmest; because they are bad conductors of the body heat, and not easily penetrated by external cold; and therefore superior to cotton or linen in cold weather. They have the additional advantage of being great water absorbers. And also most porous to air, thereby acting as a superior ventilator of that most important breathing and depurating organ, the skin.

Leather is a non-conductor of heat, and therefore very impenetrable to external cold, retentive of the body heat, and is thus a warm kind of clothing in very cold climates; though not very pliant.

India-rubber is sanitarily like the preceding. It keeps out rain, but unfortunately has the disadvantage of retaining the perspiration.

The *colour* of our clothing is not a matter of indifference from a sanitary point of view; because it materially influences both the admission of external and the retention of body heat. And therefore the importance of carefully attending to this in all but especially in very warm and very cold weather, seasons, and climates will be obvious.

Experiment has shewn that *black* absorbs the most heat in a given time. Next to it is blue, then brown, pink, yellow, green, and white, which absorbs the least of all. These colours reflect or radiate heat in an opposite ratio; white the most, and black the least. Therefore white or light grey are the most suitable colours for warm and especially for hot weather, sultry seasons, or climates. And dark colours, especially black, for cold weather, the winter season, and high latitudes. Many people however consider that light and also bright colours are really better at all seasons than sombre hues. For, though black and dark substances absorb heat best, they also radiate or give it off soonest. White clothing unquestionably retains the heat of the body longer than dark clothing. Probably the true reason of our preference for dark coloured clothing in winter and during bad weather is economy; and is not a question of comfort, but one of washing. Still it must not be forgotten that Nature gives the Polar bear white, and the bear of warmer regions dark coloured furs. Another fact which may not unfrequently prove sanitarily useful in its practical application, especially when noxious gases, smells, and especially when infectious diseases are prevalent, is that the facility which clothing has for absorbing odours depends partly on colour: black being most and white least absorbent; and partly on texture, wool being more absorbent than linen or cotton. A familiar example of this is the far greater facility with which a dark

coat absorbs and retains the odour of tobacco smoke than a white one.

Neither is the *quality* nor the *quantity* of our clothing a trivial sanitary matter. As a rule the better varieties of the different kinds of material are not only more comfortable, but in every sanitary manner fulfil the different objects required of clothing, better than common sorts. So also it is obviously necessary to wear a larger amount of clothing where or when cold prevails than in the opposite circumstances of heat: the actual and relative amount however often varying widely according to individual idiosyncrasies, peculiarities, age, and other circumstances.

The *pattern* of our clothing is another important sanitary item. As a rule, to facilitate motion, active men require garments which fit more closely than those of the more inert opposite sex. The same rule applies to busy and indolent nations or races; the Anglo-Saxon being taken as a type of the former and the Arab of the latter. On the other hand warm necessitate looser clothing than cold latitudes and seasons. Moreover, personal cleanliness requires a more frequent change of clothing, especially that worn next the physiologically active skin, in warm than in colder periods or regions.

Biblical References and Hints Regarding Clothing

The first kind of clothing mentioned in the Bible as that of the earliest ages after the fall was very simple and consisted of the *leaves* of the fig tree and doubtless those of other trees sewn together in the form of "aprons" (Gen. iii. 7). Subsequently we read of the more durable and desirable *skins* of lambs and other animals, probably slain in sacrifice, loosely hung, but still well adapted for a mild climate and a primitive state of society (Gen. iii. 21). The garb worn by Elijah was probably the skin of a sheep or some other animal with the wool left on (1 Kings xix. 13-19; 2 Kings ii. 13), and was characteristic of a prophet's office from its mean appearance (Zech. xiii. 4; Mat. vii. 15). Pelisses of sheep's skin still form an ordinary article of dress in the East. The garb worn by the King of Ninevah (Jonah iii. 6); and the goodly Babylonish garment found at Ai or robe of Shinar (Josh. vii. 21) were either ample fur-trimmed robes or embroidered skins. The early Hebrews could weave *hair* (Ex. xxvi. 7; xxxv. 6), and thus made mourning sackcloth. John the Baptist's robe was of camels' hair, like the goats' hair, common then among the poor (Mat. iii. 4). Still later on we hear of coats (Gen. iii. 21; Mat. v. 40). Weaving was thus evidently coeval with the first dawn

of civilization, and was practized with great skill by the early Egyptians. The Israelites, however, were probably acquainted with the process before their sojourn in Egypt, but it was there doubtless they attained proficiency enough for manufacturing the hangings of the Tabernacle and other artistic textures (Ex. xxxv. 35). The vestures of fine linen worn by Joseph were Egyptian (Gen. xli. 42). We also read of more costly material, *e.g.*, *woollen* (Mat. vii. 15; Prov. xxvii. 26; Lev. x. 4; Prov. xxxi. 13; Ezek. xxxiv. 3; xliv. 13; Levit xiii. 47; xix. 19; lix. 48-52; Deut. xxii. 11). When woollen, linen, and cotton were severally first used is uncertain. But the first was doubtless very early used appears from Gen. xxxviii. 12. Wool was always largely used, especially for outer garments (Lev. xiii. 47; Deut. xxii. 11). *Linen* was another material (Ezek. xvi. 13; ix. 2; xiii. 59; xliv. 17; Dan. x. 5; xii. 6; Rev. xv. 6; xviii. 16; xix. 14; Luke xxiv. 12; John xx. 5; xix. 14; xx. 7). From time immemorial Egypt was the great centre of ancient linen manufacture. In early days fine linen was synonymous with dignity and wealth (Gen. xli. 42; Prov. xxxi. 22; Luke xiv. 19). The hangings of the Tabernacle (Ex. xxxv. 25); veil of the Temple (2 Chron. iii. 14); some of the High Priest's robes (Ex. xxviii. 6, 8 ,15, 39); also some of the Priests' robes (Ex. xxxix. 27-28) were of fine linen; a holy vesture, since to the Lamb's wife it was granted that "she should be arrayed in fine linen clean and white," for the fine linen is the righteousness of saints (Rev. xix. 8), while the armies of Heaven in the Apocalypse are said to be clad in fine linen (Rev. xix. 14). Linen was also worn by the Levite choir in the Temple (2 Chron. v. 12). A coarser linen was used for certain parts of the High Priest's dress (Ex. xxviii. 42), and for the ephods of Samuel (1 Sam. ii. 18) and David (2 Sam. iii. 14). A still coarser kind was used by the very poor. It was also worn by Kings (1 Chron. xv. 27): and formed a conspicuous part of the dress of women (Prov. xxxi. 22). The winding sheet of the dead was linen (John xx. 5-6). Linen is the dress in which the Angels are represented (Ez. ix. 3; Dan. x. 5; Rev. xv. 6). During the captivity the Jews were instructed in the manufacture of linen, and perhaps cotton (1 Chron. iv. 21). It is also noticeable that the Hebrews were forbidden to wear garments composed of mixtures of divers sorts, *e.g.*, of wool and flax, wool and linen, &c. (Deut. xxii. 11; Lev. xix. 19). This law was probably made either because such mixtures were permitted the Hebrew Priests alone; or to prevent idolatrous tendencies which the adoption of a particular dress might occasion, like that of some other tribes whose Priests were clad thus; or to enforce the general idea of obedience combined with simplicity and purity.

Hair, such as camels' and goats', was also woven into clothing (2 Kings i. 8; Exod. xxvi. 7; Mat. iii. 4; Mark i. 6). *Flax* was also employed (Prov. xxxi. 13; Hos. ix. 1). *Silk* (hemp?) was also utilized (Prov. xxxi. 22; Ezek. xvi. 10-13). Real silk was probably not introduced till a very late period (Rev. xviii. 12). For the coarser kinds of clothing, and in addition to the hairy garments of the poor, we find that *tent-cloth* was sometimes used for clothing, and also *sack-cloth* (1 Chron. xxi. 16; Esther iv. 2; 2 Sam. iii. 31; Ps. xxxv. 13; lxix. 11; Rev. xi. 3. *Cotton* is first spoken of after the captivity. The ordinary external clothing of the Hebrews was extensively woollen (Lev. xiii. 4): and their inner clothing flax, linen, and fine linen.

The Bible contains many allusions and frequently speaks directly and indirectly about the different kinds or forms of clothing used in the East in early times and by the Israelites. These are spoken of under the different names of garments (Gen. xxxv. 2); raiment (Gen. xxiv. 53); apparel (2 Sam. xii. 20); clothes (Gen. xliv. 13); garb. Different varieties of apparel were moreover developed. For example, *mantles* (Gen. xxxix. 12; 2 Kings ii. 18, 13; John xiii. 4; Mat. iv. 40): *wimples*, which was either a hood (Is. iii. 22), or a veil (Ruth iii. 15), or a kind of shawl or mantle; cloak (Mat. v. 40); shirts; breeches (Ex. xxxviii. 42); *girdles* (1 Sam. xviii. 4); *bonnets* (Ezek. xliv. 8); *veils* (Gen. xxiv. 65); *head-dress* (Is. iii. 20); *sandals* (Acts xii. 8); *shoes* (Ex. iii. 5). These were all not only comfortable but also healthy, sanitary, and rational for their semi-tropical climate and inert life.

The head-dress was not considered an essential article of dress by the Hebrews. In the sacerdotal vestments it was meant for "glory and for beauty" (Ex. xxviii. 40). Subsequently it was worn mainly for ornament: for example, by nobles (Job xxix. 14); and by ladies (Is. iii. 23); and kings (Is. lxii. 3); also for holiday dress (Is. lxi. 3); and weddings (Is. lxi. 10; Jud. xvi. 8; Bar. v. 2). The regulations regarding the leper refer to the hair (Lev. xiii. 45); a fact which shews that the head-dress was not ordinarily worn in the Mosaic age. The Hebrews attached great sanctity to the hem or fringe of the outer garment or robe (Mat. ix. 20; xiv. 36; Luke viii. 44). The Babylonish garment (Josh. vii. 21), instead of skins, may have been a Royal mantle dyed with Babylonian purple; or one woven with gold and inwove with colour. As a rule the Hebrews had outer garments, which were heavy and warm; and inner ones of lighter texture. Thereby both could be varied and put on or thrown off speedily, according to the rapid and excessive changes of temperature in Judea. The Hebrew terms used shew that they had a fine kind adapted for summer wear, and a thick kind for the colder seasons. White was the

prevailing colour of their clothing. This favoured washing, cleanliness, and was symbolic of inward as well as promotive of outer cleanliness. Still, dyeing was early known (Gen. xxxviii. 28) to the Hebrews, and also embroidering with gold and silver (Exod. xxviii. 39). The inner garment was usually a long loose kind of shirt composed of wool, cotton, fine or coarse linen; and kept close to the body by a girdle. This arrangement favoured body ventilation, evaporation, and personal cleanliness in the sultry climates of Palestine, Arabia, and Egypt. The feet, so apt to become soiled and to perspire, were protected by sandals. These were often washed; a practice which promoted cleanliness, healthiness, and hygiene. The beard was deemed a great ornament among the Hebrews, and taken great care of. A heavy head of hair was also considered a great ornament; and baldness contemned (2 Kings ii. 23). On festive occasions the hair was combed, set in order, and anointed, especially on festive occasions.

The costume of men and women was very similar; but with sufficient difference to mark the sex. The chief difference between their male and female clothing lay in the outer garments; in the lighter quality of the female material, and in the women wearing a veil. Rings, necklaces, pendants, and other ornaments also formed part of the Israelitish ladies' apparel. For propriety Hebrew women were not permitted to wear male appendages, such as a staff, signet ring, or other ornaments, or warlike weapons. Nor was a man allowed to wear the woman's outer robe (Deut. xxii. 5). Neither man nor woman was permitted by law to wear the clothing of the other sex; "for all that do so are abomination unto the Lord thy God" (Deut. xxii. 5). This law was calculated to promote intermutual sexual delicacy; and to prohibit licentiousness of a most revolting kind which had already occurred. The garments of the Priesthood and the Levites were specially appointed, and distinct from those of the laity. That of the High Priest was of fine white linen, with ornamental work of gold, blue, red, and crimson (Ex. xxviii.): his general articles of attire being the breast-plate, ephod (linen), robe of ephod (linen), mitre, broidered coat (linen), girdle, breeches, or drawers (linen). The common priests' vestments consisted of four articles, namely, breeches, coat, tunic, and girdle.

It would be needless here to describe more minutely the different robes worn by the Hebrew men and women. They were looser and thinner than ours; and so unfit for our colder latitude and our more active habits. The length of their dress rendered it inconvenient for active exercise; although its looseness permitted it to be easily put off and on. The number of suits possessed by the Hebrews was often considerable. A

single suit, consisting of an under and an upper garment, was commonly worn. These were the most usual presents, five or ten being sometimes given (Gen. xlv. 22; 2 K. v. 5; Judg. xiv. 12-19). The highest token of affection was to present the donor's robe (1 Sam. xviii. 4). To produce the best robe was a special honour in a household (Luke xv. 22). These were largely kept in store (Job. xxvii. 16); a wardrobe being required for their preservation (2 K. x. 22), superintended by a special officer (2 Chron. xxxiv. 22). And, to have clothing in plenty was equivalent to being wealthy and powerful (Is. iii. 6-7). During the life of Jacob we hear of distinctive dress for maids, married women, and widows; as well as others distinctive of honest and dishonest persons; matters evidently more of purely social than of sanitary import. At a still later period dress became more complicated and costly (Is. iii. 18). During these however, as in the earlier periods, the Israelitish dress was light and loose, and made, *firstly*, to suit the warm climate of Palestine, Arabia, and Egypt; *second*, to favour the recumbent posture assumed during rest; and *third*, to facilitate the sitting or reclining attitude during meals on the ground, or on low couches, or divans covered with mats or rugs. This loose fashion of clothing was also healthy and sanitarily wise, because, *first*, it favoured escape of the perspiration, body ventilation, coolness, and cleanliness by day; *second*, it did the same at night, as the Jews often slept in their day garments; and *third*, it promoted comfort during meals and facilitated digestion.

Beyond this, little sanitary information can be gathered from the Scriptures regarding the most suitable make of our clothing for the present day and for a climate like ours: doubtless because this is in a sense a matter of comparatively little importance; and one which is therefore left mainly to individual or national taste, custom and convenience or necessity. Hebrew sandals were well ventilated, easily removed for foot washing, coolness and comfort; and hence better adapted than our boots and shoes for their warmer climate. A light calico head-dress or handkerchief was also necessary to keep the head cool during the hot land winds; at other seasons to keep the head warm; at all times to protect it from the sun; and lastly to favour cleanliness and oppose the development of scab or any other prevalent skin disease (Lev. xiii. 2), for which special purpose, moreover, the scalp was always kept closely shaved. The bustling active habits of the Caucasian inhabitants of the North Temperate Zone require more closely fitting garments than theirs. And in its northern parts warmer clothing is needed than is necessary in its southern latitudes.

But although in accordance with the law which holds good throughout the animal creation among all creatures gifted with

intelligence, there is neither folly nor crime in any woman rendering herself as attractive as possible to the opposite sex by appropriate articles of dress; it would obviously at the same time be wise if these, individually and collectively, followed St. Paul's advice; and equally wise if men did the same; so that both sexes might be mutually attracted rather by the *modesty* than by the gaudiness of the apparel (1 Tim. ii. 9; 1 Pet. iii. 3-5); and especially by the private character of those who wear the clothing (Ps. xlv. 9; 1 Pet. iii. 9; Titus ii. 4; Ex. xxxv. 25; Prov. xix. 14).

And assuredly neither does Scripture any more than common sense sanction the highly erroneous and often injurious practice of tight lacing and other foolish fashions; which, instead of embellishing, rather distort and deform the figure by displacing important internal organs, such as the heart, lungs, liver, and so forth, thereby interfering with their form and their functions, so as indirectly to sooner or later injure the local and general health, interfere with comfort and locomotion, and often also shortening life by inducing many and varied serious diseases, both functional and organic.

No pointed and direct advice but only such as is suggestive can be found in the Bible regarding the *material* of which we ought to make our clothing. So long as we get suitable stuff to meet our wants, the kind is to a certain extent and in a sense unimportant. The busy world-encircling commerce of modern times, by bringing commodities from all quarters of the globe enables us to have a greater variety than had the Israelites. So that, besides an abundance of all the above, we now have silk and india-rubber besides.

The *colour* of garments among the Jews and other peoples mentioned in the Bible story varied much. Thus *white* was worn by the Levites (2 Chron. v. 12); also by Mordecai (Esth. viii. 15). This colour is also frequently mentioned elsewhere (Dan. vii. 9; Eccles ix. 8; xxviii. 3; Ezek. vii. 18; Mat. xvii. 2; xxviii. 3; Mark xvi. 5; ix. 3; Acts i. 10; Rev. iii. 4, 5, 18; iv. 4; vii. 9; viii. 18; Luke ix. 29). White, the natural hue of the materials was the chief colour among the Hebrews; increased in brilliancy by the fuller's art (Mark ix. 3), an art frequently necessary to preserve purity, as a spot or stain readily shewed itself (Is. lxiii. 3; Jude xxiii.; Rev. iii. 4). This colour was held as peculiarly appropriate to festive occasions (Eccles ix. 8); and as symbolic of purity (Rev. iii. 4-5). It is uncertain when the Hebrews acquired the art of dyeing. Joseph's coat of "many colours" was either a variegated robe, as is probable, or a long tunic with sleeves (Gen. xxxvii. 3-23). But the notice of scarlet thread (Gen. xxxviii. 28) implies some knowledge of dyeing; and the light summer robe of Rebecca and Tamar

(Gen. xxiv. 65; xxxviii. 14-19) were probably ornamental. We have therefore no evidence of the use of variegated robes before the sojourn in Egypt, where the Hebrews learnt various modes of producing decorated stuffs from the Egyptians, who had carried weaving and embroidery to a high state of perfection. *Gold decorated* (Ps. xlv. 13), and at a later period *silver* decorated robes (Acts xii. 21) were worn by royal personages. Other kinds of embroidered robes were worn by the wealthy, both of Tyre (Ezek xvi. 13) and Palestine (Judg. v. 30; Ps. xlv. 14). The Babylonians and other Eastern nations (Josh. vii. 21; Ezek. xxvii. 24); and the Egyptians (Ez. xxvii. 7) excelled in it. The Hebrews do not seem to have maintained it. Dyeing does not seem to have been followed up in Palestine. Dyed robes were imported from foreign countries (Zeph. i. 8), particularly from Phoenicia. *Red* is spoken of as a colour of clothing (Is. lxiii. 2; Exod. xxv. 5; xxvi. 14; xxxv. 7; xxxvi. 19; xxxix. 14). We also read of *scarlet* cloth and clothes (Numb. iv. 8; Prov. xxxi. 21; Dan. v. 7, 29; Lam. iv. 51; Nah. ii. 3); and the robe worn by Saul (2 Sam. i. 24; Mat. xxvii. 28; Rev. xviii. 16). Likewise of *purple* (Mark xv. 7, 20; Jer. x. 9; Judg. viii. 26; 2 Chron. xii. 7; Esth. viii. 15; Ezek. vii. 7; Rev. xvii. 4; Prov. xxxi. 23; Luke xvi. 19; John xix. 2). *Crimson* is also spoken of (Jer. iv. 30). These colours were little used by the ordinary Hebrews because expensive. The wealthy occasionally wore purple (Prov. xxxi. 22; Luke xvi. 19); and scarlet (2 Sam. i. 24). Other nations, however, used them more lavishly, *e.g.*, the wealthy Tyrians wore purple (Ez. xxvii. 7); as also did the Midianitish Kings (Jud. viii. 26); the Assyrian nobles (Ez. xxiii. 6); and Persian officers (Est. viii. 15). The general hue of the Persian was more brilliant than that of the Jewish dress (Ezek. xxiii. 12). Blue was spoken of among the Assyrians (Ezek. xxiii. 6); Mordecai wore it (Est. v. 6; 2 Chron. ii. 7; iii. 14). We also read of many-coloured clothing (Gen. xxxvii. 3-32). These colours give negative sanitary information, as they do not seem in ancient times to have used for dyes or staining any of these brilliant hues derived from arsenic, &c., which have so often proved unhygienic and poisonous for Man to breathe or handle.

It is also interesting to note the various qualities, characteristics, varieties, and material of the kinds of clothing mentioned in the Holy Scriptures. Thus we read of the *long* raiment of the scribes (Mark xii. 38); the *silk* of the virtuous woman (Prov. xxxi. 22); the *gold* of the King's daughters (Ps. xlv. 13); *goodly* worn by Esau (Gen. xxvii. 15); and others (John vii. 21; Jas. ii. 2; vii. 21); *gorgeous* (Luke vii. 25); the *royal* worn by Esther (Est. v. 10; vi. 8); and by Mordecai Est. viii. 5), and by Herod (Acts xii. 21; 2 Sam. xiii. 8);

embroidered, in the making of which the Egyptians and Hebrews were early skilled and very fond of; those of Aaron (Exod. xxviii. 4; Ezek. xvi. 10-18); *fringed* (Numb. xv. 38); bordered (Mat. xxiii. 53; Ezek. xvi. 8); gay (James ii. 3); *dyed* (Is. lxiii. 1-3); *bright* (Acts x. 30); *shining* (Luke xxiv. 4); *glorious* (Is. lxiii. 1); *soft* (Mat. xi. 8; Luke vii. 25); *scented* and *anointed* as with myrrh (Ps. xlv. 8; cxxxiii. 2; Cant. iv. 11); *modest* (1 Tim. ii. 9); *strange* (Zeph. i. 8); *filthy* (Zech. iii. 3-4); *vile* (Jas. ii. 2); *moth-eaten* (Job xiii. 28; Jas. v. 2); *rough* (Zech. xiii. 4); *consecrated* (Exod. xxviii. 3); *changeable* (Is. iii. 22); *garments of captivity* (Deut. xxi. 13); *garments for cold weather* (Prov. xxv. 20); *wedding garments* (Mat. xxii. 12); *widows' garments* (Gen. xxxviii. 14); *Priests'* (Neh. vii. 70-72; Ezek. ii. 69). These include raiment for different ranks, occasions, and circumstances, and have mostly no reference whatever towards health preservation. Nor are these allusions symbolic.

At the same time, however, it is interesting to note how often clothing is used in the Holy Scriptures in a figurative or typical sense; and how apposite the simile usually is, like all the Bible types. Thus it speaks of being clothed with *salvation* (Is. lxi. 10; Ps. cxxxii. 16; 2 Chron. vi. 41); and with righteousness (Job xxix. 14); or with *majesty* (Ps. cxciii. 4); or with *honour* (Ps. civ. 1); or with *humility* (1 Pet. v. 5); or with *shame* (Ps. cxxxii. 18; Job viii. 23); or with *desolation* (Ezek. vii. 27). So also the *cloak* is symbolically used as an article of *concealment*; as for example for *vengeance* (Is. lix. 17); or for *zeal* (Is. lix. 17); for *cursing* (Ps. cix. 18); for *violence* (Mal. ii. 16); for *sin* (John xv. 22); for covetousness (1 Thes. ii. 5); for maliciousness (1 Pet. ii. 16). Clothing is also used figuratively by the Saviour to point one of the most important morals of Man's earthly life (Mat. vi. 30). These clearly appertain more to the hygiene and health of the soul, morals, and mind than to that of the body: to the spiritual rather than the physical sanitation. One of the chief Biblical allusions to clothing that can be turned to practical account in our ordinary human life, and which belongs clearly to the higher planes of hygiene, takes the form of a tirade against extravagance in dress. Much dress was forbidden the Israelites (Is. iii. 16; liii. 18-23). Soft, that is luxurious raiment, was also decried (Mat. xi. 8). Fringes on the four quarters of the vesture were forbidden (Deut. xxii. 12). In the earliest times clothing, as already mentioned, was very simple and unostentatious. But, as time wore on, and the Hebrews saw and mingled with, and doubtless imitated other nations, it became more costly and varied. A prodigious number of magnificent habits were at last considered a necessity, and a most important part

of the treasure of the rich, and were therefore anxiously amassed (Job xxvii. 16; Mat. vi. 19). These wardrobes were moreover plenteously perfumed with aromatics (Ps. xlv. 8). Thus the Hebrews became extravagant in dress like other nations. For this Isaiah dilates on the many robes and ornaments which the women of his day wore (Is. iii. 16). So did other prophets (Jer. iv. 30; Ezek. xvi. 10; Zeph. i. 8; Eccles. xi. 4; Tim. ii. 9; 1 Pet. iii. 3) The Bible also admonishes against estimating people either socially, morally, and above all spiritually by their "goodly apparel and gay clothing" (Jas. ii. 2-7). This remark, however, like the former is not, strictly speaking, a physical health-hint, but one of the moral, social, and spiritual kind. Akin to this, as a moral sanitary maxim is the reflexion that, according to the Bible narrative, dress, on which mankind generally often prides itself so highly is after all a badge of guilt; and memento of Man's fall from holiness, purity, and obedience (Gen. iii. 7). The hint given in Deut. xxii. 5 is a matter of social importance; and especially suggestive in married life.

Among the Hebrews the women of the family made the clothes (Prov. xxxi. 22; Acts ix. 39) when required. But usually their garments came ready made from the loom, and required little or no cutting, shaping, or alteration. Their loose-fitting garments had oftener to be mended than made; and sewing was an unfrequent art (Gen. iii. 7; Job xvi. 15; Eccles iii. 7; Ez. xiii. 18).

These facts shew that the clothing of the Hebrews was carefully considered, like all else concerning them, by their hygienic mentor, the Divinity, who would doubtless have altered or improved had it been necessary; and also that He had no special occasion to legislate regarding dress as He had on the subjects of food, drink, &c. Evidently no need arose to cavil at the material, colour, shape, &c. of their garments; matters of great import sanitarily, and therefore of special interest to a nation meant to exemplify the salient points in hygiene and teach them to other nations as models of health-help. The two points in which they were most apt to err were regarding change of clothing, to meet universally incident variations of temperature and to satisfy the demands of cleanliness. Both of these it will be seen were attended to. Otherwise the clothing of those days was a matter not so likely to endanger health, as were some other sanitary items: and therefore few definite laws were laid down or hygienic hints given beyond those above mentioned. During the 40 years of the Wanderings in the Arabian peninsula the clothing of the Hebrews was specially and miraculously attended to by the Creator. This wisely is specially mentioned. Raiment is mentioned among the things

which the Hebrews "required" at the Exodus and of which they "spoiled" the Egyptians. Under ordinary circumstances and their ordinary desert life, even this abundance could not possibly last beyond a fraction of their sojourn there. In the desert it would be impossible to make even such clothing as they wore in Egypt, and for such a multitude. Nor could they purchase enough from *hostile* tribes, or even semi-friendly ones. the occasion was Divinely chosen to manifest heavenly care. "I have led you 40 years in the Wilderness: your clothes are not waxen old upon you; and thy shoe is not waxen old upon thy foot" was the proof that Moses gave them of this Jehovistic supervision towards the end of the Wanderings; and of the miracle (Deut. xxix. 5) in His wonderful recapitulation of the Hebrew history and laws" in the valley over against Bethpeor, as found in Deuteronomy.

Although both in the Old and New Testament clothing and raiment are often employed in a typical sense, as already alluded to; no one can for a moment suppose that every allusion to clothing, whether incidental or intentional, is of this nature, even when the sanitary lesson inculcated is merely inferential. The Hebrew clothing, like that of all other nations, past and present, was a potent factor in health preservation and disease prevention, or the reverse. And these God-bequeathed lessons and hints of early times and Bible peoples regarding clothing were clearly intended to convey their interlinear lessons to us, and to remotest generations.

CHAPTER IX

HEREDITY

"A people of Inheritance" (Deut. iv. 20; Jer. xvi. 19).

Heredity or inheritance is the science which studies the personal gifts, traits, and peculiarities, good, bad, and indifferent, that we, as individuals, families, tribes, races, or nations, derive as a birth-right from our parents or ancestors; these in their nature being either physical, psychical, mental, moral, social, and spiritual; and either healthy or morbid. It is the biological law, one of great importance, by which human beings tend to repeat themselves, more or less as fac similes, in their descendants. It is a branch of one of the most potent and universal of the multiple laws of Nature. And it rules both of the two great worlds of Earth-life, the animal and the vegetable; from the most complex to the lowest forms, every one of which tends to repeat itself and no other in its progeny. In the vegetable world, for example, the microscopic bacillus and micrococcus never produce aught but their own likeness; nor do these ever develope into the Californian Wellingtonea Gigantea or the still more stately Kauri pine of New Zealand. A moss of the genus hypnum is said to have existed unchanged for the last hundred or one hundred and fifty thousand years. Nor does the clinging ivy ever become converted into its fostering oak, or vice versa. So in the animal world, the minute rotifer or amœba never become developed into the mammoth whale. Vegetable and animal alike breed true, broadly speaking; and develope similar progeny inevitably and faultlessly from age to age; thus keeping races, species, families, and classes alike; perfectly resembling their progenitors of the same kind, and unlike their cotemporaries of different kinds, though reared side by side. They never even approach, but keep totally distinct and dissimilar. Year by year Nature copies and imitates her primary pattern. Like is everywhere produced from like with no variableness in the main, or shadow of turning; except what is explainable by natural causes or laws. The laws of heredity are potent all along the line, both in the animal and the vegetable worlds. In one and every instance, plant

and animal alike, the outcome of the same great law of heredity shews itself strongly, not alone in physiological and microscopic conformation, but in pathological as well as in the far higher attributes, the instinctive, mental, and psycological, when these exist.

Heredity is one of the inheritances deeply implanted in Nature's copestone, Man, by the great Author of our being. Our main interest in heredity is confined meanwhile to Man. The secular world has long been familiar with the right and the law of the hereditary transmission from father to son of private possessions, such as houses, land, money, goods, and property of many kinds; and also heirships to titles, honours, kingdoms. But of late years heredity has been found to possess far wider significance, and has been discovered to have a still more personal interest, not as a matter of mere chance but as one of Nature's great and intentional laws transmitted systematically from parents to children; and a gift by no means so easily avoided, manipulated or transferred, as are our physical inheritances, but clinging to us as does our very life and identity, because a part of ourselves; a law interwoven in our frame, and indeed one of the great functions and facts of our being.

Male and female humanity not only give their progeny life and being, but also much more. There is no biological fact more patent now than this, that all in Man is more or less tinged with innate heredity. This phenomenon and its laws permeate and overshadow all that is human: body and soul, our every tissue, organ, function, and faculty. Onr instincts, senses, mental qualities, memory, imagination, intellect, sentiments, passions, will; our morality and psychology, physiology, mental, social, moral, and spiritual tendencies; our anatomical structure, fecundity, size, habits, deformities, colour, personal appearance, traits, and so forth, are all dominated by heredity. The comprehensiveness of the law of heredity and its intimate relations to Man make it a most important study, especially from a hygienic aspect, and its outcome the decrease of bad qualities in the race, and the development of good ones.

Heredity in Man manifests itself in different ways. Thus it may be either:—

1. Direct or parental: this may be either
   - *a* Where the child takes equally after the father and mother; the *ideal* form seldom seen.
   - *b* Where the child resembles one parent most; which may happen:—
     1. In the same sex; as from fathers to sons; or mothers to daughters.
     2. Or, as more frequently, between

different sexes; father to daughter or mother to son.

2. Reversional heredity, or atavism, where the heredity is derived from an ancestor; usually between grandfather and grandson; grandmother and granddaughter.
3. Collateral or indirect heredity, of rare occurrence; as between indirect ancestors, for example, between uncle, granduncle, and nephew; or aunt and neice.
4. Heredity of influence; as where one husband transmits some peculiarity to the children of his wife by a subsequent marriage.

To fully understand the deep and wide bearings of heredity it is necessary to study its ramifications and effects on the human body, its different parts, functions, and entities. Thus: heredity materially affects our human *anatomy*. It does not even require a trained eye to detect physical traits in our young; derived from the mother, father, or some ancestor. Even the new-born infant usually discloses some feature, expression, or characteristic which is the image of that of its parents. Others again may develope as the progeny grows, in the stature, contour, width, form of body, limbs, or head, colour of hair, &c. The facts are also potent in the domestic animals, and have been utilised practically by breeders among animals, and also gardeners, florists, and aboriculturalists. In the human subject the effects of heredity are not only external but also internal; for example in the bones, teeth, spine, &c.

Not only is our human anatomy but also our *physiology* influenced by heredity in many ways. Thus in some families the blood and blood system predominates, and we have the sanguineous diathesis running through them. In other families or even races we have the nervous system dominating, and the neurotic temperament. In others again the lymphatic, and in others the bilious systems and temperaments. These are all apt to run in and be retained in families. Idiosyncrasies also are transmitted by heredity from ancestors or parents to children and their descendants. Thus in one family or branch of it a talent for music or science may run. Or the reproductive powers may be peculiar and shew a hereditary tendency to fecundity or to non-fecundity, on the father's side, mother's side, or both. This may occur in tribes or nations. In certain families the muscular system is hereditarily developed and they are athletic in different ways—as in dancing, wrestling, cricketing, running; as with certain breeds of horses, dogs, &c. Others develope singers, orators, &c.

It is not only in health but also in *disease* that humanity inherits these hereditary tendencies. Thus it runs in some

families to live long; while others die early, and at a certain age. This also shews itself in races. Morbid heredity is also recognised in every land and nation. Thus some families enjoy a wonderful immunity from contagious diseases: others a strong tendency the other way. It is well known to medical men that some persons and families inherit a strong tendency from their ancestors to certain diseases, such as paralysis, tumours, strabismus, skin diseases, albinism, rickets, lameness, supernumerary fingers or toes. A tendency to deformity is hereditary. Other deformities are made permanent by culture; for example some Peruvians, wont to deform the heads of their children, have made the distortion natural and permanent. It is thus that the Esquimaux tail-less dogs have been formed. Bad habits and anomalies may also be developed and propagated in this way by heredity: even as good ones may be similarly intensified.

But it is the heredity of the psychological organs and functions, or Man's higher nature, which has been most studied of late: a matter of greater importance on account of its greater influence on individuals, nations, and the race; and one of which it is well we should know somewhat more than usual; although it is evidently impossible, and indeed out of place, to enter deeply into the subject here or give more than a bare outline. Man's complex, cerebral, and physiological organization necessarily make this a complex subject; and here it is impossible to do more than merely glance illustratively at the already extensive and constantly increasing subject. The chief practical question that concerns human hygiene is, what are the results or consequences of heredity on the individual, the family, tribe, community, nation, or the race as a whole. Only a few of the most salient of these can be looked at here, as the subject is both too wide and deep for complete study: and, moreover, beyond our main aim, which is to illustrate heredity, not so much from a secular as from a Biblical point of view, and especially a Biblio-hygienic standpoint.

1. The heredity of *instincts* is on the whole better exemplified in the lower animals than in Man, especially in the domestic ones: bees, ants, dogs, cats, &c. Still it is very evident even in the new-born child. No new birth has to be taught how to eat, drink, cry, and so forth.
2. The *senses* and sensorial qualities often illustrate human heredity better; thus
    a Touch is exquisite and refined among the races of southern and warm regions: and is obtuse or imperfect among more northern people. Again it runs in families to be acutely sensitive to touch from a hyper-

æsthetic skin. Large hands are inherited from ancestors who have led laborious lives, and vice versa. Left handedness also is usually hereditary.

b Seeing, near-sightedness, and far sightedness often run in families. So may congenital blindness, amaurosis, cataract, colour blindness. A special talent for colour discrimination and painting is often hereditary.

c Hearing. Some persons are often hereditarily insensible to certain sounds. So is a good or a bad ear for music; fondness for, indifference to or even hatred of music. A talent for music is very often hereditary and runs in families.

d Smell. The value of certain dogs depends on their hereditary scent. The smell of savages is also very acute. The North-American Indian can follow enemies or game entirely by the scent. In some persons the smell of cheese is hereditarily unendurable.

e Taste. The inclination to cannabalism among the New Zealanders is very lasting. So also a repugnance to water drinking is sometimes hereditary.

3. Memory. Long memories are sometimes hereditary; for example those of the Senecas and the Porsons.
4. Imagination is notoriously transmissible by heredity, as in families of poets, musicians, painters, novelists.
5. Intellect is also eminently hereditary, as shewn by scientific and philosophic ancestors.
6. The sentiments and passions. Strange propensities, instincts, dislikes, and idiosyncrasies are all frequently, nay, usually, hereditary. Thus in some families coffee is a soporific while opium is not. Some families cannot endure emetics, or blood-letting or purgatives, &c. A constant thirst and a desire for drink, dipsomania, is frequently hereditary. So is earth-eating. Sexual abnormalities are notoriously so; also the passion for gambling, thieving, avarice, murder, violent passions, and crime of many phases.
7. Will power is hereditary: as seen especially in great statesmen and soldiers.

The heredity of these is sometimes maternal, or paternal, or both: or it may avoid a parent and be atavistic.

Heredity is not only a law for individuals but for nations. Thus among the French, as the early Gauls: the ancient and

modern Greeks and Cretans: the ancient and modern Jews; the Gypsies and Cagots. In these and others we may invariably trace family heredity and likeness.

But it is especially in the domain of *disease* that the laws of heredity are of most interest and equally observable. It is our bad qualities, tendencies, characteristics, and peculiarities that we are especially desirous of reducing to a minimum and getting rid of either in ourselves or others, that we may not see them descend to our offspring. Morbid psychological heredity is above all other branches of this study, the most important, and one which all should know more or less for reasons of health and of sanitation, and preventive motives. Thus it is well to realize that there is in certain families a hereditary tendency to hallucinations in sight, taste, and smell, monomania, suicidal, homocidal, melancholia, lypemania, presentiments. Mania is very frequent, demonomania, dementia, idiocy, imbecility, general paralysis, and various forms and degrees of mental, moral, and spiritual obliquity; including hereditary vices.

Heredity being a primary and strong law of Nature, not newly begotten, but existent from the beginning and the primal pair, and one of the great laws which keep creation moving onward and evolving after God's methods: although a comparatively recent secular study; necessarily has its results on our higher nature; results which it is well for us to study briefly; because, by judicious, carefully selected, persistent hygiene, we may often succeed either in increasing and strengthening the good factors we desire to improve; or in diminishing or even eradicating the objectionable bad ones.

Heredity has its moral consequences; which are largely modified by the free will that we possess to increase or decrease them after natural laws and methods. It is also first and largely influenced by education. The children of highly moral people are likely to become by education still more moral. So on the other hand lack of education is apt to let the good in inferiorly educated people go and thus permit their inferior traits to develop. At the same time this does not always hold good, among ordinary people at least; as religious parents may find sceptics in their flock. And, on the other hand, sceptics may produce religious children. These subjects depend so much on the training and the environment as well as the heredity. So also clever parents may produce dunces, and vice versa. Drunken and debauched parents may have sober children; or the reverse may hold good: ambitious parents, offspring with ordinary desires, and vice versa. This shews that education and environment and heredity all take part in the result, some more, some less. The effects of education are best shewn not

among prominent examples; as the idiot and the very intelligent, that is the extremes of the intellectual scale; but among those of medium intellect. Genius is thus not all, even with education to develop it. Spontaneity is greater. And it does shew the great importance of selection of stock and of careful breeding from the best; as well among the human race as among domestic animals. The beneficial influence of heredity in elevating and evolving Man and his different entities, requires time, and is a slow and gradual process. Nor must we forget that the civilization we try so much and wisely to develop is only a superficial cover to Man's innate sinful nature; although this again is not Jehovah's original human initiative, but sin's debasing effect on a nature created pure and holy; a devolution of humanity and a retrogression; evil being a most potent factor to oppose all ascending healthy elevating processes, as well as to increase and aid all morbific inferior ones by a process of descent.

In our efforts to promote beneficial heredity we may educate and legislate either for individuals or for families, tribes, nations, or the race, regarding physical, moral, mental, social, and spiritual betterment; and by so doing elevate them, or by neglecting this permit one and all to degenerate; the individual in this being regarded as the atom of the family, and the family as the molecule in the mass of mankind and the human race. So also with regard to the spiritual aspects of heredity. Here, again, by education we may improve the good qualities of the race individually, and so by heredity elevate the whole: or by neglect permit the mass to deteriorate hereditarily. In this also we have one aiding force, namely religion, and the moral and social sense. But, to oppose this we have another potent force, namely evil; ever and everywhere working to do us harm and lower mankind in the scale of creation.

The social consequences of heredity are as important as its individual results in accord with their multiplication. It is clearly this that gave rise to castes, classes, and hereditary professions, such as medicine, in all primitive civilizations, such as those of Judea, Persia, Egypt, India, Assyria, Peru, Media, Greece, Rome. Thus medicine among the Greeks was originally studied by a few families, *e.g.*, the Asclepiadea or Esculapian family, who practised in the Asclepiæ, and founded the medical schools of Cuidos, Rhodes, and Cos. Of this family Hippocrates was the 17th physician. So also the art of Divination or prophecy was supposed by the Greeks to descend from father to son. So also among many peoples the priesthood is hereditary, as in Mexico, Greece, and especially Judea. As nations civilize free will gradually diminishes and ultimately supersedes heredity. By proper care, legislative and otherwise,

we may thus evolve a literary, warrior, spiritual, or moral nobility. Or by the converse methods we may enfeeble or extinguish them. Among all races there are castes, accursed, unclean, vicious, criminal, proscribed, the ancestral tendency to crime being handed down to children and grandchildren. Hence it is why the Japanese punish parents as well as the culprits. Also why the Chinaman who commits a capital crime has his ancestry and antecedents enquired into. And in the case of high treason or the princely assassinator the culprit is not only cut up, but his sons and grandsons are put to death. So in the case of Adam and Eve's guilt the whole race is involved by heredity. And under the Mosaic law children were often punished for their parents' guilt.

As one of the great biological laws of animated nature heredity is both stable and conservative. It is the law which transmits, preserves, accumulates, traits, feelings, habits, faculties; good, bad, and indifferent. Fortunately for us we can to a large extent bend the force and law of nature for our human improvement. Neglect of this permits evils to advance and good points to die out. Remembering this, and that our present theme is the hygiene of heredity; that is the study of the different means by which this dominant force and law of Nature may be so handled and guided by other natural forces and laws more or less at our command, so as to increase the good points in humanity and diminish or eradicate its bad ones: the chief fundamental facts of most interest to us here are the following:—

a That Man, both individually and collectively, derives life, health, his chief characteristics, faculties, &c., from his ancestors by heredity. The men and women of the present day practically resemble the primitive Adam and Eve; or those of that stock, if there has been more than one genetic centre.

b The same fact holds good regarding nations, tribes, and families. Thus from the negroes, blacks, or Ethiopians; the yellow or Mongolian races; and the white, or Caucasian divisions of mankind of old come those of the present day, by strains whose heredity is shewn not alone by their colour but also by other physical, physiological, and biological differences. So also the still more recent national divisions, the Egyptian, Greek, Roman, Cretan, Arabic, Jewish, and other types are similarly transmitted by heredity. Tribes and families shew similar closely marked and strong hereditary tendencies, good, bad, and indifferent. Intercourse and inter-marriage are tending, however, to break down these differences and divisions of race,

nation, language, &c., till at last all may be one family, speaking one language, as they are already one in blood.

c These hereditary tendencies, good, bad, or indifferent, may either be perpetuated, go on unaltered in the progeny; or they may increase and become accentuated, or they may decrease and be reduced to a minimum.

d So is it with the individual heredity we all derive as our human inheritance from our fathers and mothers; our human characteristics, colour, national, tribal, and family peculiarities and differences, good, bad, and indifferent. These may either increase, decrease, or remain stationary.

e This may also happen with our hereditary physical features, figure, stature, form, size, &c. These may increase, decrease, or be passive.

f So also if we study our hereditary, physiological temperaments, idiosyncrasies, and special peculiarities, we may notice increment, decrement, or stability, according to circumstances.

g So also with our hereditary, mental, or intellectual traits and tendencies.

h So also our hereditary moral proclivities, good, bad, or indifferent. These may be stable, increasing, or decreasing.

i We all inherit sin from our great progenitors, Adam and Eve. So we may also inherit good, bad, or indifferent, superior, weak, or morbific traits, from our preceding and more immediate ancestors. This also may be stationary, increasing, or decreasing.

j In all points and in every one of the entities which go to form a human being, what we are in the beginning, and start with, is mostly of hereditary origin and not acquired by our own effort.

k All of the hereditary qualities now alluded to are derived hereditarily either from our father, mother, or from both.

l These hereditary gifts are all unavoidable by and compulsory on us to receive, as part of our birthright. Although, having inherited them we may often try to increase or decrease them, according as they are desirable, or the reverse.

m Obviously it is the good points in our offspring that we desire to increase in strength and number; and the bad to obliterate or minimize. This fact is already largely utilized in the breeding of domestic animals;

and ought also to be controlled and manipulated as much as possible in our human marriage selections and alliances. It is in this way that we might largely help to diminish crime by diminishing imprudent and impure alliances; and so in the same way with disease. The tendency to insanity, consumption, scrofula, leprosy, deformities, and abnormalities of body, mind, heart, and soul; are all largely due to heredity, and intensified by transmision and training; and so are largely preventible. May we not by greater attention to making prudent marriages, cultivate, increase, and strengthen our better human traits of character and virtues in families, tribes, and nations: and on the other hand, decrease our bad and criminal ones; and thus either raise or lower our physical, moral, mental, social, and spiritual standard, by manipulating wisely according to the laws of human heredity? From this standpoint heredity, its forces and laws, becomes one of the greatest and most important sections of biology and the most interesting of studies.

n Unwise nations may help heredity the wrong way by deteriorating the people. Galton gives an example of this. By martyrdom and imprisonment and other penalties between the years 1481 and 1781, the Spanish nation doomed 291,000 freethinkers. This was at the rate of 1,000 annually for three centuries. The result of this drain of its best men and minds was, the heavy penalty of a deterioration of its breed; to which the world owes the superstitious, unintelligent Spanish race of the present day. The reverse or upward process is shewn in the children of the Brahmins of India, which spring from a class long cultivated, display intelligence, insight, docility, far superior to children of other castes. So also, widespread customs, religious or otherwise, may cause widespread deterioration by influencing heredity. Thus Galton points out the effect of the Church celibacy exaction of the Middle Ages. Gentle natures were thus supplanted by more brutal race breeders; and the ruder, ferocious, currish, and stupid portion of the community became the parents of future generations, and caused club law to prevail for centuries, and crush out the good.

o Heredity is thus seen to be a great and potent biological force, which pervades all nature, and all humanity: and to be not a loose and independent, but a controllable force, amenable to certain more or less fixed

laws; a knowledge of which we are gradually acquiring by study, with a view to their practical application for the benefit and improvement of the human race; the elevation of our physical, mental, moral, social, and spiritual status, and the eradication or decrease of the evil still so prevalent and prominent everywhere.

℘ By a better knowledge of these forces and laws of heredity, and their wise manipulation, we may not only benefit individuals, families, tribes, and our own kith, but also communities, nations, and the race, through the potent fulcrum of private, public, national, and racial effort; to which should be added secular educational training, and the infliction of communal and national laws and methods. Chief among our devices should be the inculcation of good example. Thus we may hope to gradually yet surely enlighten the public: and, aided by them, raise the individual and general standard of excellence not only as regards physical human matters, for example, prowess and martial ability; but also in far more important, because higher, matters of life, such as our physiological stamina, health, longevity, mental, moral, and spiritual standing, and the general hygienics of our nobler nature.

The practical outcome and application of these facts, one and all of the utmost importance, both to ourselves and posterity, shew:—

1st. That it is clearly both our interest and our duty so to educate ourselves; and so guide our conduct in all important life matters both physical, physiological, mental, moral, social, and spiritual; after our own wisest secular findings and after the counsel of God's Word, so as to reduce and minimize all our abnormal and inferior semi-animal traits, tempers, and tendencies, so that the least chance remains of their being transmitted to our offspring by heredity; or at least that they may be only handed on in the least objectionable forms.

2nd. That it is equally our duty and privilege, both for our own and our offsprings' sake, to endeavour to elevate, strengthen, and perpetuate all that is good in humanity by means calculated to favour their hereditary transmission.

3rd. To promote these ends alliances should be prevented by and through which such abnormalities and inferior points, parts, and tendencies might be perpetuated or perhaps accentuated in the offspring.

4th. To judiciously teach and train our offspring, that is our successors, so as to enlist their knowledge and efforts to eradicate undesirable traits and to increase desirable ones by onward transmission.

5th. Nor should we forget that it is the sum total of the people which makes the community, nation, and race; and therefore by education and fostering our good qualities, and doing the reverse for our inferior ones, we therefore cultivate widespread benefit.

6th. It is by marriage of consanguinity that much evil is thus transmitted from father and mother to children. This should clearly be discountenanced or prevented by legislation.

7th. Unwise selections, where one or both parents shew inferior morbific or evil traits or tendencies, or physical, mental, moral, social obliquities, should be discountenanced if not prevented.

8th. Private opinion, advice, and example is the first and main agent in thus promoting the development of good points, and opposing the propagation of bad ones in the human stock.

9th. Our main and united aim should be the elevation of the entire race; using the term in its widest sense, to mean an ascent, development, and improvement in every possible and wise way; in body and soul, and the different departments of these that combine to form the complete human being.

It is a natural and laudable instinct, and humanity, male and female alike are gratified to see themselves reproduced in their offspring; especially if this correspondence is in some good, pleasing, and creditable feature, trait, or peculiarity. But, on the other hand, we do not desire to see our progeny inherit our weaknesses, follies, inferior traits, and bad points. So, too, as nations and members of a race, both human instinct, kindness, and Christianity impel us to be gratified by the evolution and continuance of good qualities and virtues in our fellow countrymen and fellow creatures generally. But we do not desire to see our inferior or discreditable, still less our criminal ones, intensified or propagated. And it is well for all, private and public alike, to act upon the knowledge that both in families, communities, and nations, the good may often be intensified and the bad diminished by the slow, incessant, yet persistent, pursuit of definite plans. As with cattle, so with the human species; although, for obvious reasons, especially self-will, the former are more amenable to direction, supervision, advice, and treatment, private or legislative, than the latter. Still, authority often gives greater power among the masses, especially among

the poor, the ignorant, criminal, and labouring. It is also well to know that much may be done in these and other directions by the united efforts of public and private care. Is it not manifestly wrong to permit the criminal, the alienated, consumptive, deformed, &c., to marry individuals manifesting like tendencies; and thus perpetuate themselves, perhaps in an intensified form? The entire subject is one that has national and racial as well as private bearings. By care, time, and patience we can often in this way improve families, tribes, nations, and indeed the race. We may elevate, improve, ennoble them physically, mentally, morally, and socially: raise the type and advance them in the scale of creation. It is by this gradual but certain process of physiological and functional evolution that the European has not only been civilized but caused to inherit from 20 to 30 more cubic inches of brain tissue than the Papuan or native of New Guinea.

Moreover, all this is very much the same whether we are dealing with potentate or peasant, rich or poor, educated or ignorant, crime-free or criminal, sane or eccentric, civilized or uncivilized, white or coloured. If we desire to improve the intellect, physique, virtues, and good qualities of any or all of these by the laws of heredity, we should not be indifferent as to the selection of mates, but quite the reverse, that being a sine qua non and a chief factor in the matter. So, on the other hand, by injudicious mating we may tacitly yet surely deteriorate the entire human species in many different ways and in various points. One great rock to be avoided is the permission of consanguineous marriages. Few things tend more to deteriorate the stock than this; especially as it is often the bad or inferior qualities which are thus propagated and intensified. This is the chief practical outcome of the study of human heredity. How we may improve humanity and raise it in the scale of existence by judicious hygienic means from the degradation in which we find the mass; a degradation self-inflicted it is true, and put it on a loftier plane, physically, mentally, morally, socially; and thus aid both the Creator and the Saviour in their man-saving rôle, and so bring the race a little nearer to the plane from which it fell; become a little more like what Jehovah would have it to be; and nearer to that which it possessed when He walked and talked with its progenitors, Adam and Eve, in Eden.

Biblical Heredity

Heredity has been lately much attended to as a secular study; and is supposed popularly to be an essentially modern theme and enquiry of comparatively recent date. But while humanity has been turning a deaf ear and a dulled intellect to the truths of heredity and the application of these to the

ordinary affairs of humanity and human life, we find that its facts and their application are clearly indicated and woven like a thread all through the Bible. This is nowhere more clearly seen than in the Pentateuch, containing the early history of the human race as a whole; especially the earlier Hebrew biographies and the story of the genesis of the Hebrew people, the Ishmaelites, Canaanites, Egyptians, and other nations prominent in early human history. Here the great base facts of the science of heredity are distinctly outlined: while the source of the science and the framer of its forces and its laws is clearly revealed; as found in no other book.

The most important part of any study or science is its base fact or facts; that or those on which the entire superstructure of the science is built. The Holy Scriptures teach in many ways and by many illustrations, historical, biographical, and otherwise, the great fundamental facts of this science: especially that human beings, as individuals, families, nations, and a race, inherit not only the outward contour, height, colour, features, and peculiarities of their parents or ancestors; but also their internal characteristics, physiological, mental, moral, and even spiritual tendencies; whether these are good, bad, or indifferent. It also shews, as no other volume can, that the introduction of one potent agent, sin, into the world's history has begotten a hereditary and inalienable tendency which causes the bad to intensify and the good to retrograde. This Biblical fount of knowledge regarding inheritance should be widely known; and that in heredity the Deity has implanted in our race a potent agent for good or for evil, as we wield it; the good for us to foster and increase, and the evil to oppose and diminish if possible. Moreover, history and biography, both Biblical and secular, ancient and modern, combine to shew that with these objects in view it is of the utmost importance to check weak or bad habits and tendencies in ourselves and in our children, while both of these are still immature and plastic; and thus strive to develop and bring good ones to the front by judicious personal conduct and treatment, no matter whether the weakness we are to combat is spiritual, moral, social, mental, or corporeal. While physical peculiarities and traits are worth attention, far more so is the cultivation of good tastes and habits, all of which are as hereditary and transmissible to the offspring as are the evil ones. By acting and restraining ourselves we may perchance check, diminish, or wholly eradicate faulty tendencies in our offspring to many sad results, such as dipsomania, various forms of insanity and evil propensities, such as lust, gambling, avarice, theft, murder, immorality, and also many moral, social, and psychological consequences. Body diseases, or the tendency to them, are often hereditary; for

example, consumption, cancer, gout, rheumatism, and many others. And the hereditary tendency thereto may often be successfully combated by judicious dieting, exercise, and other appropriate hygienic matters and methods of regimen. Nor must it be forgotten that as with the body as a whole so with its every individual organ, tissue, and function. The peculiarities of these, good, bad, or indifferent, are all hereditary. As a rule no one more deplores when any bad trait or detrimental physical peculiarity crops up in their offspring than do the parents. These matters and this law make the study and practical application of heredity a matter of infinite importance to the individual family, nation, and race. This means the arresting of these, one and all, in their downward course of deterioration, and placing them on an upward course of improvement and elevation in the scale of humanity and creation. Its hygienic bearings are therefore well worth the closest attention and deepest study; not by physicians and philosophers alone but by the universal laity. The hygienic bearings of the laws of heredity on human welfare and progress generally, and on the health and disease, longevity, happiness, and vigour of individuals, families, nations, races, will be obvious. They have been longer studied in the lower animals than in Man; though the latter theme is obviously by far the more important.

This is the study to which the Holy Scriptures clearly and forcibly, yet unostentatiously, introduces us; and thus inferentially anticipated most of the facts already adduced from secular findings; seeing that so many, if not most of them, may be proved by Biblical quotation alone. As with other departments of hygiene, the Holy Scriptures in this give us not the minutiæ but the most important and leading facts, for us to elaborate. Moreover, what it does divulge is both true, trustworthy, and important when we consider its source. The aim of Bible teaching is to elevate Man, not only spiritually and morally but in every other point.

Not only is racial but also national heredity fully pointed out by Bible history. For by no nation is heredity and its effects better exemplified than by the Jews; and nowhere is this great fact better pointed out than in the Bible. The main effects of heredity usually influence the size and shape of the head and diversities of colour, face, and features. It appears not improbable, nay, most likely, that the three patriarchs, Shem, Ham, and Japeth, had, as with single individuals of many families, widely distinctive features and marked peculiarities; which, under the great diversity of climate and other hygienic environments, became so marked in the progress of time as to produce the very wide diversities of race that now prevail in Asia, Africa, Europe, America, and Polynesia. Every nation

on the surface of our globe has its own special hereditary peculiarities. Thus it is easy to recognise a Chinaman or a Japanese; a North-American Indian, or an Egyptian, &c. And it would be difficult to eradicate their special types of face, &c., even by inter-marriage, lapse of time, and totally different hygienic surroundings. The same holds good of tribes and even families all over the globe. That the Hebrews were a God-guided, heaven-helped, and specially developed people, is evident long before their emancipation history begins: and is traceable back to the genesis of the tribe and their great father Abram, son of Nahor, the image maker, who dwelt in Ur of the Chaldees, and was ninth in descent from Shem, Noah's eldest son, when the Deity selected a hygienic agent by which to benefit the Jews, then in futuro. Jehovah selected something in Man himself and not in his environment, namely his *heredity*. By making his vitality and physiological strength more perfect than is usually allotted to Man He impressed the most potent of hygienic factors and hereditary agents on Abram; the full history and outcome of which is contained in Genesis. When in Haran (Charran), after Terah died, God spake with him; the interview being thus Biblically given, "the Lord said unto Abram, get thee out of this country and from thy kindred and from thy father's house into a land that I will shew thee and *I will make of thee a great nation*, and I will bless thee and make thy name great and thou shalt be a blessing, and I will bless them that bless thee, and curse him that curseth thee; and in thee shall all families of the earth be blessed" (Gen. xii. 1-3). Later on Abram saw God, either in human form, in a vision or dream (Gen. xii. 7) after his return from Egypt, who repeated, confirmed, and made these promises more explicit thus: "And the Lord said unto Abram after that Lot was separated from him, lift up now thine eyes and look from the place where thou art northward and southward and eastward and westward: for all the land which thou seest to thee will I give it and to thy seed for ever. And *I will make thy seed as the dust of the earth; so that if a man can number the dust of the earth then shall thy seed also be numbered.* Arise, walk through the land in the length of it and in the breadth of it; for I will give it unto thee" (Gen. xiii. 14-17). In these words God set His seal on Abram as He has done on no other man or race before or since, and stamped the heredity of his offspring: giving them the best of all purely earthly blessings, namely congenital vitality and strength, thereby augmenting their virility and longevity to the utmost allotted to man. For though now the Jews have no local habitation, but are more widely scattered than perhaps any other race, yet their individuality clings. And possibly nowhere is there a Hebrew even

now that does not shew some of the characteristics either in feature or manner of his special tribal ancestor, or their common father, Jacob.

Notwithstanding their chequered career as a nation; their downfall and dispersion over many lands; the vicissitudes and oppression to which they have often been subjected, they still retain more or less their distinctive and characteristic features and traits of character, as they received these from the patriarchs Abraham, Isaac, and Jacob, and the Children of the Wanderings: and have preserved them and their heredity better than any other nation has ever yet done. This is no doubt partly, perhaps chiefly, owing to their having always and after the early Divine command, jealously guarded the purity of the race by marrying among themselves; although this rule has not always been followed, so that the race is now somewhat mixed. While this social isolation and inter-marriage therefore has its advantages, it also, from a heredity point of view, has its manifest disadvantages. The chief advantages in the case of the Hebrew, is that, as was intended, it has kept their national characteristics; prevented or lessened and delayed the inlet of idolatrous customs and other evils; and preserved their hereditary traits. On the other hand, the chief disadvantages are, that it sowed the seeds of corporeal and mental weakness and disorder. For this reason idiotcy and mental alienation are very frequent among the Jews; while the number of deaf mutes is enormous. In Germany, for example, there is one idiot among every 9,490 Catholics; one among 8,515 Protestants; and no less than one among every 6,506 Jews. The Hebrew race, however, is still remarkably long lived: and also very productive, as it was during the Wanderings. The Jews increase more rapidly than the normal population of countries. And everywhere they all possess some identical features; so that whether now or 3,000 years ago there is no mistaking them. It was the knowledge of this that enabled Pharoah's daughter on sight of the infant Moses to exclaim, "This is one of the Hebrew children" (Ex. ii. 6). Jehovah had implanted the seal of the race on the child's tiny face; and this the shrewd and kind-hearted princess at once detected. A Hebrew can still be selected anywhere. Jehovah intentionally put special marks on their forefathers and made them hereditary. They have never since been alienated; but are as manifest as ever. No doubt the different traits of character in the different tribes, inherited each from its original progenitor, are as plainly apparent even now to the Anthropological and Ethnological expert, as they were in the originals to their father, the patriarch Jacob (Gen. xlix.). "The sons of Abraham are they all" (Rom. ix. 7); as indicated by their features, business faculty, mental, moral, and

social proclivities, everywhere alike and characteristic. The Children of Israel were fruitful shews the hereditary tendency of the race (Ex. i. 7). Many of their present-day traits of character are inherited from the patriarchs themselves. "We have Abraham to our father" (Luke iii. 8) is a pregnant saying from the standpoint of heredity. They inherited far more from their great progenitor than his blessings. They were a "people of inheritance" of many kinds (Deut. iv. 20). And the Holy Scriptures point out their source; they were "inheritances given by God" (Deut. xx. 16; Ps. ii. 8). The same heredity and its effects are seen in other nations, widely separated both by time and distance. All preserve and propagate more or less their special characters, colour, physiognomy, figure, gait, stature, mental, moral, and social peculiarities. The Holy Scriptures distinguish this and make hereditarily distinct the generations of the sons of Noah (Gen. x. 1); those of Joseph (Gen. x. 2); those of Ham (Gen. x. 6); and of Shem (Gen. x. 21); those of Ishmael (Gen. xxv. 13); those of Esau the Edomites (Gen. xxxvi. 1); as well as those of Jacob (Gen. xxxvii. 2). So also the Egyptians, Chinese, Greeks, Romans, Italians; and indeed all of the marked families and races in Africa, Asia, America, Oceania, and elsewhere, all shew clearly defined and distinctive inalienable hereditary features and peculiarities.

The Scriptures give many examples of heredity as applied to families and individuals as well as nations. And not only of money (Prov. xix. 4); and lands (Numb. xxxiv. 18; Ps. cv. 11); and God's Love "the Lord is the portion of mine inheritance" (Ps. xvi. 5); and His blessing (Heb. xii. 17). Thus it gives a physiological instance of heredity among the lower animals, and also in the human species, when it tells us that all flesh is not the same (1 Cor. xv. 39); but that there is one flesh of Man and another of beasts (1 Cor. xv. 39). Still another instance is "in sin did my mother conceive me" (Ps. li. 5); and "behold I was shapen in iniquity" (Ps. li. 5). And another semi-pathological, when it speaks of the "children of fools, yea of base men" (Job xxx. 8); indicating offspring who inherit their parents' folly. Again, pathological heredity is forcibly illustrated when the Scriptures speak of "visiting the iniquity of the fathers on the children's children" (Ex. xx. 9; Ex. xxxiv. 7; Numb. xiv. 8; Deut. v. 9). Moreover, this result is comprehensive, and may be either in bodily, mental, moral, or spiritual morbidity. So "our fathers have sinned and are not and we have borne their iniquities" (Lam. v. 7) is a fact in pathological heredity which may be interpreted to include different punishments. Again, "the fathers have eaten a sour grape and the children's teeth are set on edge" (Jer. xxxi. 29; Ezek. xviii. 2) is of a like type.

So also is thou "recompensest the iniquity of the fathers into the bosom of their children after them" (Jer. xxxii. 18). Even if these had no further application, pathology, corporeal and mental alike, can fully testify how often children, male and female alike, suffer and are punished for sins and iniquities of which their fathers alone were guilty; sins and punishments alike avoidable. Some of the direst maladies that have afflicted mankind originate in this way, and are preventible. The original doer of the sin is the culprit. In individual self-restraint therefore lies the initiative of the means for preventing these hereditary maladies; which include syphilis, inebriety, debauchery, &c. "In the iniquity of their fathers shall they pine away" (Lev. xxvi. 39); and also "for the iniquities of our fathers thy people are become a reproach" (Dan. ix. 10), are also hereditary punishments. See also Is. lxv. 7.

The Holy Scriptures illustrate psychical, moral, social, and criminal heredity, "Ye are of your father the devil, and the lusts of your fathers will ye do" (John viii. 44); of course inherited through their earthly parents. "Our fathers have inherited lies" (Jer. xvi. 19) is a like case of the inheritance of moral turpidity. God "recompensest the iniquity of the fathers into the bosom of their children after them" (Jer. xxxii. 18). "So also the children of iniquity" (Hos. x. 9). "God layeth up His iniquity for His children" (Job xxi. 19). "In the iniquities of their fathers shall they pine away" (Lev. xxvi. 39). "They are turned back to the iniquities of their fathers" (Jer. xi. 10). These are all references to hereditary results of different kinds, which clearly point forcibly to the existence of this great natural law, and its results on humanity.

So also "God layeth up His iniquity for His children" (Job xxi. 19) points to the hereditary transmission of different kinds of punishment, moral, social, physical, pathological, transmitted from parents to offspring. "The seed of evil-doers shall never be renowned" (Is. xiv. 20) is hereditary punishment. Even the Hebrew punishments were made hereditary. Thus a bastard was not permitted to enter the congregation even to the tenth generation (Deut. xxiii. 2). So an Ammonite or a Moabite could not enter the Hebrew congregation to the tenth generation (Deut. xxiii. 23). The heredity of a reverse kind is shewn by "his children are blessed after him" (Prov. xx. 7). This is as likely to be in bodily, social, and moral, as in pecuniary and other strictly worldly matters.

From a Biblical point of view, therefore, heredity appears a still more important factor in human life progress, both individually, nationally, and racially. Clearly, also, it has its preventive and curative aspects regarding the bad or inferior traits and peculiarities of mankind; as well as its sanitary one to pro-

mote the increase or improvement of the good and the laudable ones. Heredity is one of Jehovah's great laws for the improvement of the human race after sanitary or hygienic methods: and is one of the most important of all the factors in the entire code of hygienic laws. It is therefore a most important sanitary study, as it is by the same agency that sin and evil and their results drag us down and so often entirely counteract the beneficent laws of the Deity. Moreover, all this proves that, as with other sciences and philosophies, and the forces and laws which govern them; so with heredity, the Author of them all has not only created them, but also pointed out their existence centuries ago, in His revelation, the Holy Scriptures; and also indicated their importance in human life for individuals, nations, and the race as a whole; and done this by the most apposite of practical examples.

CHAPTER X

MARRIAGE

"Marriage is honourable in all" (Heb. xiii. 14).

Of the many different hygienic agents that influence the health and happiness of humanity, both individually and collectively, there are few if any which do so more than the subject now in question. This conclusion will be apparent when we consider:—

1st. That it has so many and important hygienic aspects, using the latter term in its widest sense: because marriage influences the entire entity of the contracting individuals; the dual co-partnership of soul and body; as well as the physiological, mental, moral, social, and spiritual departments of these.

2nd. The numbers who have or will become involved in one or other form of this sexual relationship, orthodox and heterodox, from the very beginning of the race until this rôle ends.

But marriage has not only its hygienic or sanitary but also its Biblical aspects. These, like the former are also physiological, mental, moral, social, and spiritual. Scriptural and secular alike are not only most important but also largely interdependent and closely correlated. Do Biblical and secular ideas agree or disagree regarding this universally important matter? And, above all, what do the Holy Scriptures say on the subject? This is an important study for many reasons; not for the mere knowledge thereby imparted, but for the deep issues of its practical outcome. To satisfactorily study it from these widely different points of view, the secular and scriptural, it will be necessary to consider briefly certain points and facts regarding Man's origin, rôle, past history, and possible future: and especially to enquire what God's Book, the Holy Scriptures, say regarding His creature, Man, respecting this all-important step and momentous event in so many human careers.

A brief review therefore of the Biblical record of the institution of marriage and its early history among the patriarchs and Hebrews of the Old Testament, and especially of the

Mosaic and pre-Mosaic periods, may not be inopportune as an aid in our deliberations, framed as these facts are to further both the temporal and eternal, present and future, welfare of the Israelites; and based as they are on Man's human requirements and necessities as above catalogued.

The institution of marriage is not a temporary arrangement between two human beings; like that which prevails among the lower animals; but a much more serious, lasting, and indeed sacred contract. It is not meant solely for procreation, and the continuance of the species, as with them; but for higher and holier ends for both contracting parties. It is a contract usually entered into between an adult male and female, instinctively attracted; with a primary view of gratifying the passions and affections, and contributing to the universal desire for happiness. Marriage however often, nay usually, has far wider bearings; and generally influences the contracting parties not only physically and physiologically, but also socially, morally, spiritually, and otherwise. It usually moulds and often modifies or alters the entire life, for good or for evil, for this world and the next, according to the wisdom of the choice. So that it is universally acknowledged by the thoughtful to be one of the most important steps and epochs in life, both for the male and female. There can be no doubt that it is for this very reason that our Divine Father, Friend, and Counsellor, fully aware of the necessities and tendencies of the being he fashioned, gives much advice of the wisest nature to aid us in this momentous matter. Human beings are often impulsive, thoughtless, short-sighted, swayed by inferior motives, and apt to err from many different causes, in this all-important step of selection: a matter in which even the most prudent and cautious may err; because it is often one of exceeding difficulty; inasmuch as the true character and mutual fitness of those especially concerned are so hard to ascertain and weigh accurately on brief acquaintance: and we are so prone to decide quickly when swayed by personal attractions alone; or influenced more by these than by the higher considerations of personal worth. Accomplishments, beauty, figure, talent, wealth, position, &c., too often attract far more than the more solid and better qualities of mind, heart, and soul; a mistake that often leads to indifferent and unhappy alliances, or to such as are far less satisfactory than they should and are designed by Heaven to be; leading to marital unpleasantnesses of various awkward kinds. Mutual esteem and love, based on Christian principles, should be the chief linking bonds in marriage. Fully aware of this, Jehovah has given human beings much invaluable advice regarding marriage in His handbook for human life; especially as regards one of its chief factors and primary events, namely, our *choice* of a life partner.

On purely secular grounds the following propositions may be advanced:—

1st. That marriage is necessary for the satisfactory continuance of the race (1 Tim. v. 14).

2nd. In order to have this important and primary end best accomplished, the function has been made conducive, when judiciously entered into to our happiness and health (1 Cor. vii. 36).

3rd. Aberrations from its usual customs, laws, and practices are wrong, and often morally, socially, physiologically, and hygienically punitive.

Our present purpose, however, is chiefly to find out if the Holy Scriptures say anything on the subject of marriage; to examine what this is; and whether it coincides with or differs from the usual secular findings of modern times. The Bible gives many deep apposite and useful hints not only regarding man and woman; but also as regards these in their marital relations; as well as remarks on marriage, its motives, duties, and its sequel, the formation of what is designed to be a model dwelling. Also rules and hints for home life and the family; the earthly home being made the type and forerunner of the more extended Heavenly home, which all wise Bible-reading Christians desire to gain as children of the Universal Father.

Marriage is a special more or less binding allegiance between the male and the female of the human species. God made the race as He did the animal world, male and female (Gen. i. 27; vi. 19; Mat. xix. 4; Mark x. 6). The primal pair differed from all the rest; and from each other; inasmuch as Adam was elaborated from the Earth (Gen. vi. 7); and Eve from a rib in Adam's side (Gen. ii. 21). The creation of the primal pair was thus very dissimilar, possibly intentionally so for several reasons; *first*, to manifest God's versatility as a creator; *second*, to assign each of the new beings their proper place in the scale of creation; *third*, to make the gentler sex of finer mould; *fourth* to initiate the race, then in the primary and pure plane of its existence, when it was only a "little lower than the Angels" (Ps. viii. 5; Heb. ii. 7-9). No *man* can "do such miracles" (John ix. 16), but "with God nothing is impossible" (Luke i. 37). And hence doubtless why some imagine the Bible story of creation a mere allegory: and that wonders like that in the higher biological evolution cannot be effected, even by the omnipotent and versatile Creator. To many minds of materialistic type the creation of the primal paid appears unworthy of belief, because:—

1st. It is out of the course of earthly nature and mundane things; as we know, see, and investigate them in a planet where each new offshoot has its own single or

double progenitor: whereas these were a special formative, immediate and miraculous development, differing from those which now prevail and that we have ceased to deem unusual and no longer consider wonderful, because so familiar, frequent, and common. Such doubters seem to forget that possibly these exceptions to the laws of earth may be the rule elsewhere and constantly occurring in other orbs; where they may be as much laws of nature and creation as is our human physiological mode of development on this planet. The Deity is exceedingly versatile, and shews this in the variety of modes of reproduction and generation, as He does in all else: thereby manifesting His Divinity by His wondrous ingenuity. In the permanent formation of human beings the Godhead as a rule only works after one method. But in other orbs He may employ countless others. And may thus have selected and employed one of these from elsewhere, and from some other creative centre, to originate the primal pair, Adam and Eve, and initiate the human race.

2nd. To create the first man and woman of the Adamic race thus, as a special and unusual manifestation of creative power, although impossible to us, even in conception, would clearly be no great effort to the God who evolved those myriad stars and the innumerable forces, laws, and grades of life that doubtless inhabit them. Man cannot weigh or measure God by himself (2 Cor. x. 12): or estimate Jehovah's omnipotent capabilities by his puny, limited, and implanted ones. "Thou art a Man and not God" (Ezek. xxviii. 2) is a text that educated humanity, human talent, and even genius, should never forget.

The lesson we seem chiefly meant to learn from the special creation of the first man and woman, especially the latter, is the foundation upon which the union between the man and wife is built; namely identity of nature and oneness of origin. The woman's flesh and the man's were alike. The human man and woman thus begun differ in some respects; not only zoologically but also physiologically, mentally, morally, and especially genetically. But still they are and are meant to be the complement of each other; both being a marital "helpmeet"; mutually meant to make a complete whole, mentally, morally, socially, and spiritually, by judicious selection and union. Man is the senior and natural head of the two. The race is named after him; "let us make *man*" (Gen. xxiii. 6). Man was originally God-created (Deut. iv. 32); and made in God's spiritual

image and likeness (Gen. i. 26; ix. 6). But the fact that he was created, and was of lowly origin, "the dust of the ground" (Gen. ii. 7), should teach him humility, dependence on and love for God. Woman was made as a helpmeet for man because "it is not good man should be alone" (Gen. ii. 18). Yet man is the natural head of the woman (1 Cor. xi. 3). For "the man is not for the woman but the woman for the man" (1 Cor. xi. 9); although genetically and by God's arrangement "man is by woman" (1 Cor. ix. 12). In all these Biblical details of text, illustrating and corroborating text, we mark the bestowal of the woman "helpmeet" and the institution of the marriage state as forming another of the many inducements and helps held out for man to lead a healthy and wise life; and hint that this should form his "whole duty" (Eccles. xii. 13): that he should be a "man of God" and as perfect as man may be (2 Tim. iii. 17); having the "spirit of God" (Rom. viii. 9); and being "approved of God" (Acts ii. 22). Also that he should strive to be an "honourable man" after the Bible model (1 Sam. ix. 6); that "his goings should be of the Lord" (Prov. xx. 24); striving even "to make his ways please Him" (Prov. xvi. 7). And although there is "no man that sinneth not" (1 Kings viii. 46; 2 Chron. vi. 36); and all mankind often err more or less, though not perhaps in marital and home ways, still the mutual, unselfish aid of a judicious, loving helpmeet is clearly one of the great means given by the Deity to point out the wisdom, and incite the duty of leading a godly life (Luke xxi. 36); and of walking closely in God's appointed way. This is the manner of man we should all endeavour to be if we were wise; the being that a true woman has a right to expect to find in her helpmeet. In the authoritative Holy Scriptures alone we find the chief characteristics, spiritual, moral, social, mental, and physical of the *ideal man.*

A brief review of the status of Bible women and the early history, in which they play a very prominent part, is not unedifying, but the contrary. Women are much noticed and spoken of all through the Bible and in many connections. Nor in those days were they deemed inferior or made nonentities and drudges in human life, as is often the case yet, at least among semi-civilized or barbarian races. The teachings of the Bible are to cherish the sex. Women are often commended and praised; and still more so in the higher capacity of wives. For although "woman is of the man" (1 Cor. xi. 8), *i.e.*, originally sprung from him, as Eve was from Adam, and genetically initiated by him still; yet "the woman is the glory of the man" (1 Cor. i. 7), morally and socially. All Christian minds honour that sex which claims their wives, mothers, and sisters. A brief summary of Bible allusions will indicate the true position and

high consideration of women during the many ages over which Bible story extends. Above all, though the Holy Scriptures clearly indicate the original social equality of the sexes; a position from which nothing has since occurred to degrade woman. This is seen, first in the history of their creation; a helpmeet is not an inferior. Second, by the name assigned her, not by God but by man, namely Eve, the mother of all living (Gen. ii. 18-23); a name which differed from his own only by having a feminine termination, clearly pointing to the duty and conduct of the husband towards the wife, as laid down later on in the New Testament (Ephes. v. 28-31).

Several usages interfered with the preservation of this Biblical equality. Thus Polygamy disarranged it. So did the autocratic powers vested in the head of the family by the patriarchal system. So also did the treatment of captives. Still, under the Mosaic law and the force of public opinion a high tone was maintained on this point, in the Hebrew commonwealth at least. And the position of women then contrasts favourably with that of the present day in Eastern countries generally. Of old, Hebrew women enjoyed a large amount of liberty; nor were they immured or veiled, as now in the East. Both wives and maidens mingled freely and openly with males in the duties and pleasures of life. In Egypt Sarah wore no veil (Gen. xii. 14-19). Rebecca, while actively employed in fetching water from the well, and also while travelling, was unveiled till she met Isaac (Gen. xxiv. 64-5). So also with Rachel, whom Jacob kissed while leading her flock in presence of the shepherds (Gen. xxix. 11). At that period maidens might go about unprotected without impropriety; and to molest them was to be severely punished (Deut. xxii. 25-27). Moreover, Hebrew women took a prominent part in public celebrations. Thus Miriam headed a band of singing and dancing women to commemorate Pharoah's overthrow (Ex. xv. 20-21). Jephtha's daughter gave her father a triumphal reception (Judg. xi. 34). The maidens of Shiloh danced publicly in the vineyards at the yearly feast (Judg. xxi. 21). Women feted Saul and David with singing and dancing on their return from defeating the Philistines (1 Sam. xviii. 6-7). That Hebrew women occasionally shewed great talent and high intellectual cultivation, and occupied correspondingly lofty positions in public estimation is shewn by the Odes of Deborah (Judg. v.) and Hannah (1 Sam. ii. 1). During the Wanderings, and no doubt later on, the women were taught by the Priests in higher, moral, social, and spiritual matters. Joshua read the law before the women (Josh. viii. 35). Women occasionally held public offices, considerable latitude being allowed them. Thus Miriam (Ex. xv. 20); Huldah (2 Kings xxii. 14); Noahdiah (Neh. vi. 14); Anna

(Luke ii. 36), and above all Deborah the "Judge" (Judges iv. 4); who were all inspired teachers or prophetesses. The notorious Jezebel took an active part in the government of Israel (1 Kings xviii. 13, 21, 25). Again, Athaliah usurped the throne of Judah (2 Kings xi. 3). But the mass of Hebrew women mainly strove in the management of household affairs. Indeed this was their chief task and duty. Thus they did not consider it menial, even of the better born to fetch water from the well (Gen. xxiv. 15; 1 Sam. ix. 11); or tend the flocks and herds (Gen. xxix. 6; Ex. ii. 16); or to prepare the meals (Gen. xviii. 6; 2 Sam. xiii. 8); or to occupy their leisure hours in spinning (Ex. xxxv. 26; Prov. xxxi. 19); or making clothes for the family (1 Sam. ii. 19; Prov. xxxi. 21); or clothes for sale (Prov. xxxi. 14-24); or for charity (Acts ix. 39). Throughout the Scriptures the value of woman's housewifely virtue and activity in such matters as the above forms a frequent topic (Prov. xi. 16; xii. 4; xiv. 1; xxxi. 10). Feminine industry was praised and inculcated in Mosaic days. The wise-hearted did spin (Ex. xxxv. 26). Women's influence and value were correspondingly great. It was the wife who controlled the household arrangements; selected, invited and received guests (Judg. iv. 18; 1 Sam. xxv. 18; 2 Kings iv. 8). In polygamous families this influence was transferred from the wife to the mother; a separate establishment being deemed necessary for the wives as a body; or for each individually (Esth. ii. 9; ii. 3; 1 Kings vii. 8). When journeying each wife had her separate tent (Gen. xxxi. 33); and the females probably took their meals apart from the males (Est. i. 9). Moreover, women went to festivals; either as guests (Job i. 4; John ii. 3); or as attendants (John xii. 2). So that on ordinary occasions it is probable they joined the males at meals. So in New Testament times. And then, too, they were advised to be exemplary in apparel (1 Tim. ii. 9); sober (Tit. ii. 4); holy (1 Pet. iii. 5). The liberty which Hebrew females enjoyed in Bible times may be deemed an index of what is their due; the position in the home and social life they ought to occupy, as apportioned by the All-wise. It closely corresponds to what is now common and the rule in all civilized Christian communities. In like manner their arrangement of household affairs and domestic matters points to their designed and proper vocation as the complement and helpmeet, specially elaborated for man. Woman is praised as a whole: but the value of a virtuous and active housewife is extolled (Prov. xi. 16; xxxi. 10). So that she was paramount in the household and her influence supreme; a fact which shews the direction her efforts should in most instances take when providence throws the chance in her way. It is after this lofty Biblical stamp that we would regard our mothers and our

sisters. And after it should every wise man make choice of a wife. Woman was made and meant to be man's helpmeet and social equal; and so, like him, has an equally lofty destiny before her if she chooses. As with Man, the Holy Scriptures give the chief characteristics of the ideal woman and wife.

Jehovah having created the two factors necessary for this new human relationship, that of husband and wife; initiated this new institution, marriage, between the primal pair; and inaugurated the beginning of the race of man; let us now enquire what the Holy Scriptures inculcate about these important matters by way of advice or to define their object and value, their rôle and purpose in nature; and relation to the Creator who instituted them for the double intention of continuing the race judiciously and after approved methods, and preventing promiscuous intercourse, as among the lower animals;, with its many and great evils. Clearly from a cursory view of Scriptural teaching marriage is or ought to be a much higher and holier arrangement than the largely legal contract that modern times have made it: and should have certain requirements and considerations, which the Holy Scriptures fully, carefully, repeatedly, and forcibly point out. These are:—

1. It should have a Divine basis. Marriage should be contracted only "in the Lord" (1 Cor. vii. 39); although this is not either the popular worldly opinion or the universal custom, even among Bible believers. But it has better endorsement; and is the advice of the Omniscient, All-wise, Mighty, and Infallible Counsellor. Those who have followed His teaching can fully attest its wisdom. Those who have not, cannot judge by their own experience. That religion is the true and only safe basis for marriage and love, its surest keynote, can be attested by many; although it may not be believed by the crowd of the stamp of those who laughed at Noah's warnings regarding the flood; and even disregarded the preaching of the Messiah. Too many marry hastily, blindly, and unwisely for purely secular motives and fleshly impulses. To base matrimony on Bible advice may to many, perhaps the majority of mankind, be deemed effete, sentimental, chimerical. Nevertheless, Jehovah's counsel is always wise and His promises ever kept. And to ask what is His will in this vital question and one of the most important steps in life; and follow His light and leading will be surely found to bring the highest possible earthly happiness, and that satisfaction and peace which earth and earthliness can neither give nor prevent, even when other mundane aids to felicity, such as wealth, position, title, and so forth, may be withheld or minimized. That which those who do marry wisely and after Godly advice do find in each other far more than fully compensates for that which may seem a

detrimental lack. This may not be perhaps what we think or intend to do. But it is clearly Scriptural counsel, and thus what Christians at least should follow: and how those should feel who strive to do God's will in all the affairs of life, obey His laws closely, and take His advice in everything of importance, especially in this one of the most momentous events of life. Religion should be the basis and motive force in all human love, especially in that high and holy form which mutually attracts the sexes. Religion should cement and link the marriage bond of love; ever increasing together as time rolls on, until it absorbs all else; desires nothing better than its continuance in heaven; to be there laid at the feet of its Giver, and absorbed in the eternal love. The wise and blest husband is he who can be and is the lover for aye. Permanent accretive far surpasses evanescent affection.

Hence it is why we find much pertinent advice regarding religion, love, and marriage in the Bible: and the intimate connection of the former two with marriage, which the Holy Scriptures does not regard as a trivial affair, but a most serious though most joyous event. For "the ways of the Lord are right" (Hos. xiv. 9). In this matter, therefore, we ought to do what is right "in His sight" (Deut. xii. 25). For the Lord "shall be with the good" (2 Chron. xix. 6). In this as in all else it is Man's wisdom to "lean on the Lord" (Mic. iii. 11). Like Moses, when in doubt, as he often was, we should bring our cause before Him (Numb. xxvii. 5). So with Hezekiah, who "spread" it similarly (2 Kings xix. 14). Thus with heavenly light and leading to aid our own heart deliberation we may be able to say, "this is the Lord's doing" (Ps. cxviii. 23); the thing proceedeth from the Lord (Gen. xxiv. 50); inasmuch as both help (Ps. cxxi. 2) and blessing "come from the Lord" (Ps. xxiv. 5). So also does "man's judgment" (Prov. xxix. 26). For God is in all things, and therefore in this (Deut. iv. 7); and asks, desires, nay, longs, to be consulted by us and trusted (Ps. iv. 5; xxvi. 1); and that not slightly but with all our heart (Prov. iii. 5). And this event of marriage is specially and purposely quoted; for is not "a prudent wife from the Lord" (Prov. xix. 14). And, vice versa, no woman should marry a man except "in the Lord" (1 Cor. xi. 11). So also when married it is "in the Lord" that they should submit to their husbands (Colos. iii. 18); a form of submission in which all true and loving women glory and delight. Love in the Lord is not tyranny, injustice, or degradation; for it is mutual forbearance and concession. It is then that we have the ideal marriage; and union of souls as well as hearts. The children of this world marry (Luke xx. 34); but how often from inferior and purely worldly motives and earthly promptings. The twain

should not only become one flesh (Gen. ii. 24), but also one in soul, aim, thought, and aspirations. This great truth, of priceless value to man, has not only lain imbedded in the Holy Bible for over thirty centuries, but has been intentionally, specially, and forcibly pointed out and made a prominent fact in its pages by many telling social incidents. Marriages are not made in Heaven, although they should be ratified there. For even the selection is of the man and the woman's own free will. But they should be Heaven-advised and God-approved. Nor is this idea mere old-fashioned sentiment; or an antiquated, obsolete idea meant only for Bible times. Jehovah's interest in man is as active now as then. The wisdom and safety of the Scriptural advice regarding marriage are as certain now as when the Holy Scriptures first pointed it out centuries ago. A mutual interest and affection for the God of Love who brought them together; who inspired the attracting earth love; perpetuates and augments it as time progresses, and makes it desire to be carried beyond the grave; where, though there shall be no marrying and giving in marriage, nothing but spiritual affection and intercourse being the rule, we may surely be loving companions in doing God's will and mutually working in His service. Ideal marriages are not pure fiction but are to be met with, and are the consummation of earthly bliss, and a true foretaste of Heaven.

It is therefore supremely wise for Christians to marry Christians only. "Be ye not unequally yoked with unbelievers" (2 Cor. vi. 14). In this special way we flee from idolatry (1 Cor. x. 14): even as the same rule was given the Hebrews of the Exodus during their Wilderness education, and had to keep apart from other nations (Lev. xix. 4); all of them idolaters. Neither were they permitted to make marriages with them (Deut. vii. 3; Josh. xxiii. 12); but advised to marry in their own nation; and only or generally in their father's tribe (Numb. xxxvi. 6); although this rule was not always kept (Numb. xxxvi. 3). For many reasons religious should not marry irreligious people. It is a demoralizing spectacle to see individual souls following, striving, and fighting for beauty of form or face instead of the nobler and more precious qualities in a helpmeet.

The Hebrews of the Wanderings were kept apart from vicious and idolatrous nations to prevent spiritual, moral, social, and physiological demoralization and idolatry by inter-marriage, evil intercourse, and incitement to sin. The danger of disobeying was shewn by their sad defections and punishments, as with the Moabites (Numb. xxv.). The punishment for marrying with the ungodly was foreshadowed, "Moreover it shall come to pass that I shall do unto you as I thought to do

unto them" (Numb. xxii. 5). Let it be realized by all that marriage and its satisfactory solution is a question that affects not only the human physical health, vigour, and longevity, but also the social, moral, and the spiritual life; the inner and sacred as well as the outer and visible life; our career for eternity as well as for time; and it will be at once conceded that matrimony is one of the most important steps in the life career of individuals: nor should it be entered into hastily, unadvisedly, or without due deliberation and consultation with the author and disposer of all events.

The Holy Scriptures, for counsel and prayer for advice, are Man's best guides in the matter of marriage; and less fallible than what is human. Whoever asks and follows these, acts best both for his earthly and his spiritual welfare. "Godliness with contentment is gain" (1 Tim. vi. 6); and a prudent "wife is from the Lord" (Prov. xix. 14; Prov. xviii. 22). Christians have other eyes than worldlings; and their views of life are wider and deeper. To those who have experienced the mutual sanctified love of husband and wife; and the combined light and leading which intensify their trust and affection for Him who bestowed, hallows, and directs both, these will seem blessings of incalculable value, such as only Christian minds and hearts can conceive and realize. It is to effect and cement this, and to prevent the reverse, that the Holy Scriptures take such trouble throughout to forbid unwise marriages; and illustrates these by examples even among great ones like Solomon and David. "Be yet not unequally yoked" (2 Cor. vi. 14) is a most vital command. Christians should not wed unbelievers. An ungodly husband may convert his wife to his own erroneous views; or the wife the husband; and thus lead again to other serious sins and evils abhorrent to God, who so longs and aids us to be good, pure, and loyal to Him and to ourselves. Those who, led by Heaven, have been so fortunate as to have married happily can testify that from a spiritual point of view alone marriage is one of earth's greatest prizes and highest boons; a double union of body and soul; an earthly and a spiritual tie. To marry "in the Lord" is eminently judicious and ennobling. The believing husband and wife sanctify and help one another in the Godly life (1 Cor. vii. 14).

2. But Godliness alone is not a sufficient inducement or bond for marriage: nor is it all that the Bible suggests to promote its happiness and its hygiene. Love and mutual esteem are also essential. The love which mutually attracts the sexes is intangible and indescribable, like that for God. But like this it is from Heaven and Divine; of and from God, "for God is Love." Our human love is a loadstone that draws us towards its centre and source, Jehovah. It is a spark given each of

God's human children by the All-Father. It is one of the greatest and most valuable gifts and talents lent each of us to tend, put to usury, and develope on the objects provided by the Beneficent for that sole purpose; viz., our fellow creatures, neighbours, parents, children, and, above all, that Being who is our second and better self; whose love is more precious to us than any other next to God's. Love is the factor which converts the home into an earthly heaven, a foretaste of the single but far vaster Fatherland and Home of the All-Father, prepared for the community of the Saints and those of His earth-children who love and serve Him.

Marriage should not be contracted solely to gratify the animal passions. Love based on Christian fellowship should be the main factors in the tie. Affection should be the dominant feeling: that intangible, inexplicable, wayward, mysterious attraction, impulse, and affinity between two human hearts; which no man can define, explain, originate at will, or prevent: a tendency and instinct implanted in humanity, developed by the Deity and a minor semblance of that which emanates from Himself, whose very essence and highest attribute it is; and a foundation therefore on which and on that alone marriage should be contracted if we would have it to be stable and satisfactory. Marriage contracted for other motives and on other foundations are unwise and often unsatisfactory. In a union of hearts only can we expect to be perfectly happy. And in no condition of life is the Bible truth more applicable than in this, that "better is a dinner of herbs where love is, than a stalled ox and hatred therewith" (Prov. xv. 17). Poverty with is better in married life than luxury without love.

The highest degree of that impulse which dominates in man and attracts him towards father, mother, children, and fellow-men, is also that which ought to be the chief attractive force in all marital selections and affinities. This celestial feeling is from God; and it is our high honour to thus resemble Him in possessing this invaluable gift and attribute; no doubt a spark, like our soul and our life,, from him. Jehovah gives no sentimental advice in His Bible; and is infinitely wiser than we are. The banner over the home should be love (Cant. ii. 4); such love as many waters and trials cannot quench (Cant. viii. 7). The best picture of a Heaven-blest earthly home is that which the Bible supplies. If we strive to follow its advice then "the God of Love shall be with you" (2 Cor. xiii. 11). For "love is the fulfilling of the law" (Rom. xiii. 10); of the Royal law of love (Jas. ii. 8); for who dwelleth in love dwelleth in God (John i. 16). Therefore husbands, love your wives as Christ loved the Church (Ephes. v. 25; xxviii. 20; Col. iii. 19); "live with the wife thou lovest" (Eccles ix. 9). "He who loveth his wife

loveth himself" (Ephes. v. 28). So also "young women love your husbands" (Tit. ii. 4); "love one another with a pure heart" (1 Pet. i. 22); as "Christ also hath loved us" (Ephes. v. 2; 1 John iv. 19); and also God (2 Thes. ii. 16). Husbands and wives alike should therefore be "like minded, having the same love" (Phil. ii. 2); for herewith is "love made perfect" (1 John iv. 17); and also "fearless" (1 John iv. 18); "without blame before him in love" (Ephes. i. 4); "rooted and grounded in love" (Ephes. iii. 17); "forbearing one another in love" (Ephes. iv. 15); "knit together in love" (Col. ii. 12). The home ties; the mutual love of parents, children, and, above all, that of husband and wife, is the cord that links and draws us to Heaven the source and abode of love itself. It is for this purpose that love is bestowed. Nothing pleases its Divine Giver more, or benefits us more highly, than our care of the development and fruition of this great gift. Nothing contributes better to the full conception and realization of Jehovah's ideal home and marriage tie than the highest success of our efforts. Nothing will contribute more to the happiness of our future eternal home than the highest, holiest, and purest elaboration and care of the earthly home. Love, such as grows with the years and mellows even after earthly attractions have fled; and that desires to be perpetuated in the companionship of eternity; should form the basis of every true and healthy marriage.

Jehovah's interest in and blessing of His great human institution of marriage, is bestowed not only on the primaries therein concerned; especially such as wed as He advises; but also on its physiological results. The Holy Scriptures throughout give evidence that "children are a heritage of the Lord" (Ps. cxxvii. 3). "I and the children the Lord hath given" (Is. viii. 18; Heb. ii. 13). "Him who of the very stones could raise up children" (Mat. ii. 16; Luke iii. 8). From Heaven come the blessings of the breasts and of the womb (Gen. xlix. 25); and a mis-carrying womb (Hos. ix. 14); or barrenness (Gen. xx. 18; Prov. xxx. 16; Is. lxvi. 9). Childlessness in man is deplored (Jer. xxii. 30); as it also is in woman (Lev. xxvi. 20; Gen. xv. 2; xxx. 2; Ps. cxiii. 9). Under the Mosaic law every male that first opened the womb was deemed holy (Luke ii. 23). One and all of these texts are acknowledgments of Divine superintendence and love in this matter of children and marriage, as in all other important affairs of life; to possess which may be said to be a universal and instinctive craving in human nature, especially in females. The Bible clearly distinguishes between "children of the flesh" and children of God; that is either unregenerate souls or offspring of shame (Rom. ix. 8). The blessing and aid of God in the bestowal of children was especially shewn in the history of the early Israelites; among

whom there were no miscarriages and none barren (Exod. xxiii. 26; Deut. vii. 14). Every married woman being constantly and continuously prolific during her term of sexual life. Even Pharoah's edict to slay every male child (Ex. i. 22) could not prevent the Israelites from increasing with supernatural and enormous rapidity (Exod. i. 21). This unexampled virility and fecundity was continued during the whole of the Wanderings; so that the gaps left by the death of the Kadesh-Barnea mutineers were rapidly filled up; for "their children multiplied as the stars" (Neh. ix. 23). Nor with this consideration in view, superadded to innate maternal affection, is it surprising that young women should be advised to "love their children" (Tit. ii. 4). Nor in the face of Hebrew history and biological tendencies is it strange that barrenness was deemed undesirable and a reproach. The Bible gives some noted illustrations of barrenness and pertinent stories connected therewith; *e.g.*, Sarah (Gen. xvi. 1); Rachel (Gen. xxx. 1); Manoah's wife (Judg. xiii. 2); Hannah (1 Sam. i. 2); Elizabeth (Luke i. 7). On the other hand this view adds force to the Bible hint that the "glory of children are their fathers" (Prov. xvii. 6); and furnishes one reason why the obedience of children has been strictly enforced by a special section of the Decalogue, the fifth.

Moreover, the sacredness and issues involved in this tie have been endorsed and enhanced by being made typical of the highest, holiest, and most important truths. In the Holy Scriptures we find frequent allegorical allusions to marriage, brides and bridegrooms, and guests. Not only did Christ endorse and sanctify human marriage by His presence and help at one (John ii. 7); and there performing His first and an important miracle; but He speaks of it figuratively by the closest of all relationships regarding the connection between Him and the Church" of which He is the head" (Ephes. v. 23). Thus the Church is the "bride the Lamb's wife" (Rev. xix. 7-9; xxi. 9); and "a bride adorned for her husband" (Rev. xxi. 2). Blessed are those children of earth who are called to the "marriage supper of the Lamb" (Rev. xix. 19). Christ's supreme joy in His Church is described as that of a bridegroom (Is. lxii. 5). Christ Himself is likened to a bridegroom (Mat. ix. 15): while the Church is the bride (2 Cor. xi. 2); a simile by which St. Paul appositely illustrates the position and mutual duties of the human husband and wife (Ephes. v. 23-32). Various important phases, actions, and events in human life are also illustrated in the Holy Scriptures by allusions to marriage and its ceremony. Thus by the parable of the ten virgins waiting for the bridegroom (Mat. xxv. 1-13); that of the marriage feast (Mat. xxii. 1-14); and the marriage garment (Mat. xxii. 1); the latter shewing the qualifications necessary for admission

to heavenly discipleship. The ornamentation consequent on a mutual love of Jehovah and His people is described as "bridal" attire (Is. xlix. 18). On the other hand, Israel is described as a false wife (Is. i. 21); Jehovah as the injured husband who divorces her (Ps. lxxiii. 27) on account of affections alienated by idols and false gods (Deut. xxxi. 16). Figuratively speaking, the issues of marriage are truly those of life or death to the souls of men and women. Nor should the bond be entered into hastily, frivolously, or unadvisedly; as it clearly includes and affects the very highest form of human hygiene, that of the soul —the true and permanent Ego.

The Holy Scriptures therefore strongly endorse and enforce the conclusion that the mutual relation of husband and wife should include and be mainly a marriage union of souls; one of infinite and lasting affection and tenderness. Husband and wife should be not merely temporary but life-long friends and lovers; the bond increasing and deepening with age. Each being to the other a sharer of pleasures and sorrows; a mutual help in trouble; an aid in advancing each others holiness, fitness for death, and for the attainment of everlasting life; all of them God-approved and Heaven-sanctioned desires, in which a mutual wish to continue partners and companions for eternity as well as for time does not appear to be forbidden, even though the life and environment and new conditions are such that there is to be no more marrying and giving in marriage (Mat. xxii. 20; xxiv. 38; Mark xii. 25; Luke xxvi. 35); although there will no doubt be, as here, loving friendships and companionships, such as befit that beatific place and its sanctified inhabitants.

From all this it will be evident that humanity and especially civilized Christian peoples cannot thank God too deeply for the institution of marriage, and especially for the religion and love, those twin instincts that combine to hallow the bond and link two mutually attached souls to each other, and both to heaven. Without these no worthy and ennobling feeling would remain to make the wedded pair cling to one another, and the home sacred. Mankind would be reduced to the level of the lower animals; attracted only by unrestrained license, lust, and selfish indulgence. The senses alone would be the ruling motive power; and all the finer pleasures and attractions that conspire to make a wise man and woman's home their earthly paradise and temporary heaven would be completely in abeyance. Man and woman would deteriorate in the scale of creation; and women, wives, mothers, and sisters alike, lose their high place they now hold in the estimation of all high-souled, right-thinking Christian men. Earth would be little else than a pandemonium; a miniature hell, peopled by fighting, struggling, quarrelling demons. And marriage reduced from a permanent

bond to one which lasted only till some new fancy or fleeting attachment prompted change.

It was a practical knowledge of the sexual frailty, fickleness, and depravity of the human heart in fallen man; of the state of human society in the early days of the peopled world; of the universally debased and wickedly criminal relation of the sexes; of the state to which sin had brought mankind in the earlier centuries before the Dispersion and the Flood, a condition which still largely prevails among existing nations, and from which He desired to save the Hebrews, His prospective model nation; that impelled Jehovah to make the seventh commandment against adultery and unrestrained license, and also the tenth commandment, compelling restriction each man to his own wife. And it was the same knowledge of what human nature is apt to become if left free to do as it pleases, and to the sole advice of sin and Satan, two ever present and dire foes; that impelled Jehovah to inspire all of the Old and New Testament writers to pen so strongly against vice; uphold virtue and obedience to God's commands; and also warn so often and deeply against the opposite conduct in its multiple forms of lust, concupisence, adultery, fornication, bestiality, sodomy; warnings of which it is only necessary to name a few to shew their intensely sinful nature in God's sight, and His utter abhorrence of them.

From a purely spiritual point of view the marriage tie wisely entered into contributes very highly to our human happiness and health, according to their hygienic surroundings, as derived from and based on the higher life, and on our holier modes of regarding and of living our mundane existence, and of making our earthly one a career not of bodies only but one of souls, and a matter of eternal as well as one of purely earthly consideration. To this again is superadded the felicity derived from the social results of marriage, and those that accrue from its lowest of all planes, the physiological. Marriage should contribute very materially to our spiritual or soul health and hygiene.

3. Man's social instincts impel him to marry. The desire of having a home of one's own, implanted in male and female alike, is another potent factor prompting towards marriage, and that a healthy, *i.e.*, hygienic one. For from this point of view also marriage has its hygienic aspects. The individual who works, seeks, plans, and cares only for himself, loses some of the greatest enjoyments in life. Marriage is salutary by promoting good, social conduct. Like the birds, most people aim at having a "nest" (Job xxix. 18). And, if the desire for children, even among married people is not universal, the love of those who do possess them is unmistakeable and widespread. The

family circle is one of the most potent helps to human happiness: and therefore contributes largely to social hygiene: as its absence also does the reverse. A happy home adds to the felicity and comfort alike of parents and children and the community over which it is reflected. While, again, a combination of many happy homes gives tone and health to the nation and the race. The true Christian regards the temporal or earthly home as the miniature foretaste of and prelude to the permanent heavenly home, where our love will be perfected and fully gratified under the fostering paternal rule of the Universal Father. To possess a wife or husband, a home, and children; to have home, companionship, friendships, and associations of our own; loved and loving beings to cherish and toil for, is a factor that contributes largely to the welfare, health, and hygiene of human society.

The true home is equally beneficent in opposing evil silently and by example. Its allurements entice others to make similar nests. How much vice of different kinds, immorality, drunkenness, gambling, betting, and so forth, is due to the lack of a suitable restraining helpmeet, children, and home, by the wayward and the weak? How much does the sum total of this add to the unsatisfactory condition, lack of prosperity, and misery of communities and nations, it would be difficult to say. But it is an obvious danger, to diminish or remove which would be obviously wise when this is possible; although a hard task, as the free will of at least two individuals, is so deeply concerned. But it is one which good example goes a long way to remove; combined with judicious instruction after Biblical models. For any man to have no helpmeet or children to lovingly care for and keep, is a factor than which few others are more likely to destroy in time all of the best Bible-described, heaven-inculcated, and safest foundations of human society. Without the curbing and ennobling influences that so materially elevate our ideas of true and pure womanhood, home, its ties and accessories; society, and therefore man, even among so-called civilized peoples, would be a dangerous quagmire and seething cesspool of all that is vile in our sin-steeped and Satan-led race: of lust leading to license; that to crime in every possible shape, form, and degree of intensity; both towards our own and the opposite sex, making it an unsafe world to live in; and dangerous from social, moral, and still more from spiritual standpoints. For even in vicious things familiarity engenders contempt; that again begets indifference and carelessness; these again leading perhaps to tampering with guilt, and that almost inevitably to our more or less speedy downfall.

Vicious ways of various kinds, but all equally disastrous to man, and still more so to Christians, are thus initiated. From a

social standpoint, marriage usually contributes materially to prevent this; through the satisfaction of having a home which is ours and children which belong to us alone, and add to our happiness of body, mind, and heart; and that add so largely to that felicity that springs from physiological reasons alone, to make the sum total of individual and family human happiness. How pure and sacred and inviolate we deem *our* shrine! How we respect that of others! And thus also marriage contributes to the healthy tone of the community and the nation. This again to the general happiness; and that again to its prosperity and well-being and well-doing; to its social health and hygiene; the public weal being only the sum total of that of the home and its occupants.

4. Moral impulses also should prompt the majority of individuals to marry; and especially to make a wise and if possible a permanent and agreeable selection; not a hasty ill-advised, regrettable and unstable one. The morality and moral aspects of marriage are important; and have their hygienic aspects. The love which attracts two souls and makes them deem each other the best in the world; that keeps them in every sense true to one another; that causes them to shrink even at the bare idea of falsity in thought, word, or deed; that makes them fonder of each other's society than that of anyone else; and that realizes that the tie is holy and divine: are all motives calculated to keep the connection free from alien contamination and adverse outside influences. The moral hygienics of marriage are salutary both to the conscience and the mind and soul; to the whole of the higher nature both of woman and man; and thus healthy and helpful to the morality of the community, nation, and race. The morality of the latter two begins in the home and the marriage bond. How the purity of a mother and sisters alone elevates, ennobles, combines, and contributes to keep a young man from sin and impurity, even in thought. How much more that of a wife, the one soul that is our chosen affinity and ours alone. Without that moral rampart and that pure, heaven-blessed, guided, and guarded love that enshrines the home, man would sooner or later become little else than a lustful savage. The race would not be men sacredly guarding wife, home, parents, and children, but beings at perpetual warfare; neighbour battling with neighbour, prompted by desires of the lowest kind, and with no fixed beacon or aim in life except those of the most depraved and unhealthy kind. To have no genial home-ties, companionships, and associations is the chief factor to make men form others of a far less salutary and, in many senses, far more disastrous kind. The morality of the race, the nation, the tribe, the family, begins and centres in that of the marriage bond and

the home. Clearly, therefore, marriage and a well-chosen companionship contribute largely and directly to the health and hygiene of the primaries chiefly concerned; and indirectly in an equal degree, by preventing those irregularities and all their many evils apt to accrue from its avoidance; among which not one of the least is moral degradation and unhappiness of the worst kinds. Wise marriage is one of the world's greatest moral factors; and adds largely to the moral hygiene, health, and happiness of individuals, families, nations, and the race. The Holy Scriptures inculcate the curbing even of the lawful and permitted appetites and desires, such as that for food, drink, ambition, &c. Still more does it advise care regarding the lower feelings, so apt to run riot unless checked. The God of purity points out that even the very inmost thought of impurity is sinful in His sight (Mat. v. 28; xv. 28; 2 Pet. ii. 14). Immorality and sensuality may be of the mind and morals as well as of the body. No moral system and no moral hygiene are so strict as those designed by Heaven for Man. Marriage is designed to safeguard them.

5. Purely physiological reasons also make marriage judicious; because good for health and happiness; eminently hygienic and repellant of disease in many forms that may follow its non-fulfilment in either sex. Its primary design is to continue the species: and in effecting this satisfactorily the Creator has designed it to conduce to our mutual happiness, health, and the prosperity of which it is one of the most important agents. Although, like all other corporeal hygienic factors that may militate either for or against health as they are indulged in, *e.g.*, eating, drinking, sleeping, exercise, rest, &c., all contributing more or less to human felicity; so this hygienic gratification also should follow the Bible maxim regarding moderation (Phil. iv. 5). Moderation in all things, hygienic matters included, is the keynote of the Holy Scripture teaching. Jehovah not only made the female as the complement of the male and intentionally instituted marriage: but also made the laws of Nature, and those of the married state to correspond. His Sinaitic law; that is His expressed interpretation, so far as it goes, of His law of Nature, takes grave and even paternal cognizance of the human generative functions; and lets this be known all through the Bible. The "blessings of the breasts and the womb" are His (Gen. xlix. 25); while "children are from the Lord" (Ps. cxxvii. 3). The special increase of the Hebrews, their vitality, general physical vigour and virility, were special promises to Abraham and his seed. Their fecundity and virility were under the Divine sway (Ex. xxiii. 26; Deut. vii. 14): and according to the Mosaic law the male

and female have each their ceremonial obligations, according to sexual differences.

It thus appears that the health, happiness, prosperity, and hygienic interests of the whole man, and of his several entities, spiritual, social, moral, mental, and physiological; of his soul and his body, are all promoted by the wise fulfilment of the Divine ordinance of marriage. Moreover, the reverse is very apt to happen by its non-fulfilment; or by the formation of unworthy alliances; especially by objectionable outlets and entanglements. Health and happiness of body, mind, morals, and spirit are all apt to deteriorate by celibacy, and its possible consequences. As a rule the strongest, healthiest, and longest-lived men and women are the married. The results of celibacy in both sexes has passed into proverb. So, too, of the married and the unmarried, from a mental, moral, social, and spiritual point of view. Other things being equal, the healthiest in one and all of these respects are those who have wisely obeyed the beneficient ordinance of God, and His great law of Nature, by marrying wisely, after scriptural advice.

Marriage being thus so helpful, healthy, and wise for mankind, ought all, males and females alike, to marry? If not all, who should? This vital question the Bible also answers wisely and well. Comes to the rescue in our dilemma, and helps Christians at least to settle the matter satisfactorily, as it so often does many other questions relating to human life and conduct. St. Paul says it is a question which every man and woman must decide individually, seeing that it involves so many interests, mainly of personal import, which the person alone can settle. Paul says what evidently suits the majority, "if they cannot contain let them marry; for it is better to marry than to burn" (1 Cor. vii. 9). Paul evidently possessed the moral and physiological power of self-control, and so gives this good advice to the unmarried and widows, "it is good for them if they abide even as I" (1 Cor. vii. 9). He was evidently either unmarried or a widower, and shunned the cares of marriage. He adds concerning virgins, male and female, "it is good for a man so to be" (1 Cor. vii. 26). And again, "Art thou bound unto a wife, seek not to be loosed" (1 Cor. vii. 27). "Art thou loosed from a wife, seek not a wife" (1 Cor. vii. 27). "But and if thou marry thou hast not sinned, and if a virgin marry she hath not sinned, nevertheless such shall have trouble in the flesh" (1 Cor. vii. 28). He adds, "I will that younger women marry" (1 Tim. v. 14). Both the married and the unmarried have their own special troubles, physiological, pathological, and otherwise; and no one can infallibly advise any other person either against or for marriage. Only the person most concerned can decide. But for the majority of men and

women, marriage and that close intimacy of the sexes which this implies is supremely wise and indeed necessary, physiologically and hygienically: physiologically, health-preserving, and hygienically disease-preventing. It contributes, moreover, to the maintenance of that high standard of morality that God requires of all mankind, and is their highest happiness and wisdom to pursue by following the sixth and tenth commandments closely. It is equally contributory to a healthy condition of the social, moral, and spiritual atmospheres, all of which go hand in hand. It contributes to the happiness and health of the majority of both sexes in everyone of those modes. It should add both to their happiness and holiness. But to do this it should be judicious, careful, and Biblically wise. Thus:—

1. It is clearly unsafe, even when other conditions are fair, for age to mate with youth; these two extremes usually having widely different ideas, pursuits, and proclivities. A very old man ought not to marry a very young woman. 2. So for an old woman to wed a very young man seems equally repugnant to the laws of Nature, and unwise. 3. Nor ought the very young and immature in body and mind and every other qualification, marry until sufficiently developed, and physiologically, socially, morally, and spiritually fitted for the duties and responsibilities of the Christian life.

On the other hand, let us not forget that marriage is an earthly and not a heavenly institution, although the idea was begotten and elaborated there (Mark xii. 25; Luke xx. 35). And that although marriage is honourable (Heb. xiii. 4; 1 Tim. v. 11), yet all persons need not marry, and therefore ought not to do so; thus women need not (Ps. lxxviii. 63); nor need men (Mat. xix. 10; 1 Cor. vii. 9; 1 Cor. vii. 36). No inconsiderable number both of men and women do not feel inclined to marry; their necessities neither prompt nor demand it. They neither require nor desire a helpmeet and life partner. Paul's advice suits all classes, male and female, married and unmarried. He gives the Christian world friendly and suitable warning "for the fashion of this world passeth away" (1 Cor. vii. 32). "He that is married careth for the things that are of the world how he may please his wife" (1 Cor. vii. 33). So also the unmarried woman careth for the things of the Lord, that she may be holy both in body and spirit: but she that is married careth for the things of the world how she may please her husband" (1 Cor. vii. 34). Again, "if any man think he behaveth himself uncomely towards his virgin and need so require, let him do what he will, he sinneth not, let them marry. Nevertheless,

he that standeth stedfast in his heart having no necessity but hath power over his own will and hath so decreed in his heart that he will keep his virgin doeth well" (1 Cor. vii. 37). And he sums up thus, "so that he that giveth her in marriage doeth well: but he that giveth her not in marriage doeth better" (1 Cor. vii. 38). Thus from a personal standpoint Paul says that marriage is good; celibacy better. The latter involves less worldly care and permits greater time for spiritual matters.

Widows, in Paul's judgment, are happier if they so abide (1 Cor. vii. 40); but yet is "at liberty to marry whom she will" (1 Cor. vii. 39); but wisely and therefore only "in the Lord" (1 Cor. vii. 40). Could there be wiser advice regarded either from a Christian or purely secular point of view? But this permits greater latitude than former ages. According to the law of Moses widows should not marry (Deut. xxv. 5). The Jews, even in Paul's time, considered re-marriage undesirable and widowhood laudable and a sign of holiness (Luke ii. 36-7; 1 Cor. vii. 40), except in the case of young widows (1 Tim. v. 14). Yet primary marriage is indirectly commended and endorsed by widowhood being deemed honourable and heaven-protected (1 Tim. iii. 5; Ps. lxviii. 5; Jer. xlix. 11); and blameworthy to oppress them (Deut. xxiv. 17; xxvii. 19; Mal. iii. 5).

These remarks apply to healthy and sane persons only. Those afflicted with acquired or hereditary taints and tendencies find a new element introduced into the question. Where these diseases, taints, or weaknesses, bodily, moral, mental, or social are found, the question of marriage is rendered all the more difficult to solve; and should only be decided on wise medical advice (Heredity, Chap. 9). Judicious matrimonial selection is an important question from a hygienic point of view; the prevention of disease by the union of diseased, deformed, or imperfect and degenerate individuals; with all their attendant evils on families, communities, and nations. Many conditions, anatomical, physiological, physical, mental and moral are handed down from generation to generation by the inexorable and fixed laws of heredity, which are not morbid, and to which there can be no special objection, such as peculiarities in height, mental and moral qualities, &c. But there are others which are morbid, decidedly objectionable, and to be coped with, interrupted, or lessened if possible. These may be classed under the heads of:—

1. Persons with a redundancy of organs, such as supernumerary fingers, toes, &c.
2. Persons with a deficiency of organs; too few, &c.
3. Persons shewing arrests of development, *e.g.*, harelip, &c.
4. Persons having unhealthy functions or structures of organs or systems of organs, *e.g.*, deaf mutes, &c.

5. Persons manifesting disturbances of the whole body in the form of diathesis or constitutional diseases especially apt to occur at different epochs in life; *e.g.*, scrofula, phthisis, cancer, &c.
6. Unhealthy persons afflicted with hereditary or acquired diseases, of frequent occurrence; rheumatism, gout, syphilis.
7. Persons afflicted with special proclivities or susceptibilities to take disease, *e.g.*, scarlatina, whooping cough.
8. A large group of diseases, often hereditary, including nervousness, epilepsy, catalepsy, and the neurotic or nervous ailments generally in which "the whole head is sick, the whole heart faint, and there is no soundness in it" (Ps. xxxviii. 3; Is. i. 6).
9. Consanguineous alliances.

In such cases not only should the individuals primarily concerned, but also their relatives, friends, and physicians, try to diminish or prevent disease, especially hereditary ailments, in two ways; namely:—

a By preventing ill-assorted marriages.

b By guiding tainted children by proper mental, moral, social, and physiological education and regimen; continued if necessary through life. Consanguineous marriages, of frequent occurrence, become even when there is no taint, in two or three or four generations the source of much deformity and misery; which are apt to remain fixed by transmission through successive generations.

The Holy Scriptures is the only book that tells us authoritively what marriage truly is; that explains its scope, meaning, aim, object, and results; its primary bearings, side issues, and possible outcomes: that enables us to realise its import as a health-giving and health-keeping or hygienic agent; for the entire man, body and soul: that shews how it interpenetrates and affects his earthly life for good or for evil; how it influences even his worldly and his eternal future; his interests both for time and for eternity; and decides that it is not an evanescent but a constant factor either for joy or sorrow, weal or woe. "He that findeth a wife findeth a good thing" (Prov. xviii. 22). Of course that means a good wife. A prudent wife is from the Lord (Prov. xix. 14). Accordingly, husbands are advised to rejoice with the wife of their youth that brings them so much joy (Prov. v. 18). "A virtuous wife is a crown to her husband" (Prov. xii. 4); whose heart doth trust her (Prov. xxxi. 11); and praiseth her (Prov. xxxi. 28). A man should cleave to his wife (1 Cor. vii. 10). For he that loveth his wife loveth himself (Ephes. v. 26); mutually bearing and forbearing in love (1 Cor.

v. 1); the husband duly obedient to the wife, and the wife to the husband. No praise is so welcome or more appreciated as that bestowed by God-fearing wife and husband; and no yoke so light. It is only by a full recognition of these truths, and especially this, that the wife and husband figuratively become one; and by conduct to correspond that the full bearing and benefit of the marriage bond is fulfilled; and that complete unity and oneness in thought, feeling, and action are induced and acted up to, leading to the most perfect earth-love and happiness in this life, and the most likely help towards the attainment by both of the greatest of all objects of human existence, namely, the glory of God while here, and a happy future hereafter, which is its final copestone and highest consummation.

As regards age the Bible lays down no restriction. Early marriages are approved (Prov. ii. 17; v. 18; Is. lxii. 5). And regarding this we must remember that according to bodily development what is early in one country, race, or nation, may not be so in another. As a rule the sexes are more precocious in warm, tropical, than in colder temperate or polar latitudes.

While thus endorsing regular matrimony, against irregular relations of the sexes, unlawful marriages, and lusts of various kinds and degrees of turpidity, the Bible warns in the strongest and most unmistakeable language (Lev. xviii. 19-20): not only because heinously wicked in a spiritual, moral, and social point of view; but also because they naturally tend to produce physical deterioration and abnormalities of individuals, families, nations, and the race; as well as a decay of population. The irregularities now spoken of include unnatural crimes and practices which pure and healthy human nature instinctively abhors and is ashamed of: and which are only followed by the mentally, morally, and spiritually most degraded and abnormal individuals of the human species. All Divines and medical men know how detrimental these practices are to the entire man: alike to his body and his soul; to his physical, physiological, moral, mental, and spiritual health, hygiene, and happiness: and how much detriment and disease in one and all of these departments arise therefrom. What a mass of sin and disease, pain, woe, misery, and trouble would be prevented if these aberrations in man's normal sexual relations could be checked or altogether prevented. Aware of this, the Holy Scriptures warn strongly against them both as a hygienically preventive measure for alleviation, and as a curative measure of hygiene. Be not unequally yoked together seems to include these as well as irreligious marriages, near of kin, &c.; and is a very strong and stern command (2 Cor. vi. 14).

1. Polygamy. Why this was permitted in earlier Old

Testament days, even among Godly people, is not part of the present enquiry. It is not now allowed, according to the New Testament dispensation. The later Holy Scriptures decry and forbid it now. To sensible Christian medical minds and Divines, for one man to have many wives, and indeed more than one; or one wife more than one husband; is altogether wrong, and unwise from every point of view, physiological, hygienic, moral, social, and spiritual. Although Jehovah only created one wife for Adam, and evidently deemed that sufficient, sin tempted and led human nature to soon break the implied rule; although Jehovah's original Edenic institution is evidently that alone which is approved of all through Holy Writ. Lamech, the first polygamist on record, had two wives (Gen. iv. 19). Abram took Hagar with Sarah's consent because she was barren (Gen. xvi. 4). Jacob married two sisters Thus polygamy was frequent and recognised in those days (Gen xxxi. 50). The Sinaitic law forbid a man to take a multitude of wives to himself (Deut. xvii. 17). Moreover, by the same law, polygamy was to be to a certain extent curtailed in the person of their prospective kings (Deut. xvii. 17), that his "heart turn not away" from his duties as Jehovah's earthly viceroy. One of the social disadvantages of concubinage is legislated for by the Mosaic law (Deut. xxi. 15). Yet Gideon had many wives (Judg. viii. 30). David had Abigail and Ahinoam (1 Sam. xxv. 42-44). And the apposite family episode in verse 44 is well worth notice regarding another of David's wives, namely, Michal, Saul's daughter, and his other wives (2 Sam. v. 13). Solomon had no fewer than 700 wives, princesses, &c. (1 Kings xi. 3). His marital history is worth study. He loved many strange women besides the daughter of Pharoah (1 Kings xi. 1), women of the Moabites, Ammonites, Edomites, Sidonians, and Hittites, of the nations concerning which the Lord had said, "Ye shall not go into them, for surely they will turn away your heart after their gods" (1 Kings xi. 2). Yet Solomon, though warned, was thus led to follow after other gods, Chemish and Moloch, and thus lost his kingship (1 Kings xi. 11) for disobeying God; a warning to all. Still later Rehoboam had 18 wives (2 Chron. xi. 21), and the text adds, "he desired many wives" (2 Chron. xi. 23). Still later King Joash had two wives (2 Chron. xxiv. 3). The mis-

chievousness of polygamy and double marriage is shewn by the Bible (Deut. xxi. 15-20), and legislated for by the just law of the first born, where one wife is loved and the other hated, to ensure justice in inheritance of the offspring, and to prevent sentimental wrong. The Bible warnings shew that excessive polygamy is wrong from a spiritual point of view. Morally, it is only pandering to the lowest passions. Socially it cannot contribute to the happiness and hygiene of the home. Physiologically it is wrong in causing effeminacy in the male; being adverse to the happiness of the female by deprivation, and erroneous for the children so begotten, as apt to be puny and degenerate bodily and mentally; poor stock to perpetuate a family or a race. Polygamy is altogether unhygienic; and therefore is wholly forbidden by the new Christian dispensation. A man is to be the husband of one wife (1 Tim. iii. 2); the wife is to have only one husband (2 Cor. xi. 2; 1 Tim. iii. 2; Titus i. 6). Let not the wife depart from her husband (1 Cor. vii. 10). Every woman was to have her own husband (1 Cor. vii. 2), only one, and that not another woman's. From the first marriage and the earliest days of the race the woman's desire "shall be to thy husband" (Gen. iii. 16). The longing for love and appreciation was instinctive and mutual (Gen. xxix. 32). So let every "man have his wife" (1 Cor. vii. 2), that is only one. Such a heaven-sanctioned union was to be blessed and fruitful (Ps. cxxviii. 3).

2. Concubinage. This is not the place to discuss why this aberration was permitted in early Bible times, even among God-fearing people, of which the following are examples. We have a touching episode regarding Rizpah, Saul's concubine (2 Sam. xxi. 12). David took him more concubines and wives out of Jerusalem (2 Sam. v. 13). Solomon was lavish in concubines as in wives and had 300 (1 Kings xi. 3). Rehoboam took three score concubines (2 Chron. xi. 21). Concubinage, especially when excessive, may, like polygamy, be conducive to the semblance of greatness. A heathen potentate may regard the number of his concubines and his wives to indicate his majesty. Christians regard it as both secularly unwise and Biblically wrong. Concubinage is forbidden by the New Testament creed; and no doubt for the same individual and racial reasons as alluded to under polygamy. It is detri-

mental in every way; to the man and the woman and to their progeny.

3. Lust. Against this one of the still lower grades of aberration in sexual matters and the more degrading kinds of animal passion indulged in for the sole gratification of self, and never sanctioned legally or otherwise in any age, the Holy Scriptures is most emphatic in denunciation, and shews the utmost hatred and contempt for them in every form; and also by making them punitive. The Christian should not be drawn of his own lusts (Jas. i. 14): should not fulfil the lusts of the flesh (Gal. v. 6); the lust of uncleanness (2 Pet. ii. 10); the lust of the eye (1 John ii. 16). Men should not lust after beauty (Prov. vi. 25). Even the looking on a woman to lust causes moral adultery (Mat. v. 28). We should not permit lust to begin or conceive its bad thoughts (Jas. i. 15); and, worse still, make provision to fulfil lust (Rom. xiii. 14). Young persons especially, in whom passion is new, strong, and strange, should take care to guard against and "flee youthful and hurtful lusts" (1 Tim. vi. 9; 2 Tim. ii. 22). And all Christians should crucify the fleshly lusts (Gal. v. 24). Nor should our conversation be in the lusts of the flesh (Ephes. ii. 8). These are all matters of vital import and constant application in moral, social, and spiritual hygiene, and all equally necessary for the health, happiness, and welfare both of the human body and soul. How much soul sin and how much body disease are caused solely by forgetfulness and lapses in the direction now named all physicians know. That it is the little beginnings, the earliest encroachments, that we must ever watch, guard against, and crush, is both Bible teaching and the personal experience of all thinking minds who are master of themselves, and weigh and manage their inner life justly and honestly. Oppose beginnings is as fundamental a law in moral, social, and spiritual, as it is in physiological hygienics and body disease. It is the small commencements of moral, social, and spiritual evil which are the most easily crushed; not the more mature and stronger ones.

4. Concupisence, another name for the same aberration, is equally abhorred Biblically. Sin works "all manner of concupisence (Rom. vii. 8). And there are various degrees of sin of concupisence (Lev. xviii.; xx; xv; Deut. xxvii.). Christians should not walk in the lust of concupisence (1 Thess. iv. 5); but

should mortify it (Col. iii. 5). Like lust it is bad both for body and soul; and therefore to be hygienically and preventively avoided for the present and prospective welfare of both. Bible teaching endorses the secular voice in deprecating this sexual aberration.

5. Lewdness. This is only another variety of lust. "Lewd fellows" (Acts xvii. 5) and women (Ez. xxiii. 44) are decried. Lewd ways are deemed shameful (Ez. xvi. 27), and to be "abhorred," and avoided (Jude xx. 6; Jer. xi. 15; xiii. 27; Ez. xxiii. 29; xxiv. 13); especially in Priests (Hos. vi. 9). Lewd thought leads to lewd license; and sins against body and soul; against which the Holy Scriptures join and antedate secular teaching in warning against and pointing to purity in thought, word, and deed, as the remedy both for prevention and cure.

6. Adultery. Against this, the actual physical commission of sin, the Bible speaks in the very strongest language. "Thou shalt not commit adultery" is the sixth law of the Decalogue. While "thou shalt not covet thy neighbour's wife" is the tenth law. Under the law of Sinai the heaviest punishment was awarded for this; "the adulterer shall be put to death (Lev. xx. 10); and so also with adulteresses (Lev. xx. 10). The adulterer God shall judge (Heb. xiii. 4). Therefore we should not "commit" this sin (Rom. ii. 22). The Holy Scriptures recognise the general tendency to it at certain times; thus "an adulterous generation" (Mat. xii. 39; xvi. 4). So pure is God's law and so clean would He have us to be that we are to avoid having eyes full of adultery (2 Pet. ii. 14). We should even avoid it in thought and in imagination; "whoso looketh on a woman" except purely hath committed adultery with her in his heart" (Mat. v. 28). It is most unwise for many reasons; "whoso commits adultery lacketh understanding" (Prov. vi. 32). He that doeth it destroyeth his own soul (Prov. vi. 32). The vice may be personal, or widespread, and even national, as with Israel (Jer. iii. 8): and is often associated with other vices such as theft (Jer. vii. 9); one crime often leading thus to others. It is unwise, because always known to and seen by Jehovah, even when most hidden from our fellow men: "I have seen thy adultery" (Ex. xx. 14; Deut. v. 18; Mat. v. 27; xix. 18; Rom. xiii. 9; Jer. xiii. 7; xxiii 16; xxix. 23); both in the wife (Ez. xvi. 32) and in the husband (Hos. iv. 13). It is certain to be punished by Him. The

seed of the adulterer and the whore are despised (Is. lvii. 3). The adulterer shall not inherit the Kingdom of God (1 Cor. vi. 9). Adultery is a spiritual, moral, social, and physiological sin. It degrades soul and body; heart and mind. In every sense it is not only unhygienic but also morbific and therefore altogether unworthy of the Christian; and a huge stumbling-block in the career of either sex. In this conclusion Biblical knowledge confirms secular findings. The punishment for adultery under the Mosaic law was; for a man with a married woman, death to both by stoning; for a man and betrothed woman the same; for a man and a non-betrothed maid against her will, death for the man; for seduction of a non-betrothed maid, marriage (Ex. xxii. 16). A false accusation of a newly-married man that his wife was not a virgin was punished by a heavy fine, &c.

7. Fornication is also strongly warned against in Holy Scripture. For, what a mass of sin and its dire results, sickness, sorrow, remorse, ruin, are caused by this unrestrained license between the sexes; which can only be prevented by its strict and strong avoidance, and the combined mental, moral, spiritual, and physiological battle that all persons so tempted ought to wage against it. It is possible for beings to give themselves over to fornication (Jude vii.); nay, to be "filled" with all fornication (Rom. i. 29). The human body is not meant any more than the soul, for fornication (1 Cor. vi. 13). We should flee (1 Cor. vi. 18); avoid (1 Cor. vii. 2); and abstain from it (1 Thes. iv. 3). "Give not thy strength to women" (Prov. xxxi. 3). To accomplish this hygienic purpose we must "mortify" our members (Col. iii. 5); and not let fornication, filthiness, foolish talking, jesting, or evil lusts and habits be even "named" among us (Ephes. v. 3). It is filthiness (Rev. xvii. 4), spiritually, morally, socially, and physiologically; and one of the worst of earth corrupters and polluters of mankind (Rev. xix. 2). Christians therefore should not company with fornicators (1 Cor. v. 9). Nor shall fornicators inherit the kingdom (1 Cor. vi. 9). The avoidance and suppression of fornication would be a very material factor in promoting the health, hygiene, happiness, and prosperity not only of individuals, families, communities, nations, and the race. Secular knowledge on this point is strong and forcible, and is fully endorsed by Bible teaching and pointed Bible narratives from

Genesis to Revelation. The story of the Wanderings is deeply tinged by this; and no better instances can be adduced than theirs to prove how true it is that "whoremongers and adulterers God will judge" (Heb. xiii. 14).

8. Sodomy was a comparatively early sin (Gen. xiii. 13), and dates back at least to the days of Abraham and Lot. Not even ten righteous persons could be found in Sodom by the Heart-searcher. Its filth was so vile that He rained fire and destroyed it (Gen. xix. 24) to shew His abhorrence of its abominations. His continued abhorrence and the possibility of its occurrence are shewn by His Sinaitic legislation, which often denounced and punished it. "Thou shalt not lie with mankind as with womankind, it is abomination" (Lev. xviii. 22); and both transgressors were put to death (Lev. xx. 13). "There shall be no whore of the daughters of Israel, nor a Sodomite of the Sons of Israel. Thou shalt not bring the hire of a whore or the price of a dog (Sodomite) into the house of the Lord thy God for any vow; for even both these are abomination unto the Lord thy God" (Deut. xxiii. 17-18). The price of Sodomy was refused as a religious contribution. In Rehoboam's time there were also Sodomites in the Land of Judea (1 Kings xiv. 24), as well as "high places and images" and groves for which God punished the Hebrews by the hand of Shishak, King of Egypt. Later on the good King Asa took away the Sodomites and idols his father had made (1 Kings xv. 12); as his son Jehoshaphat took the remnant of them still later on (1 Kings xxii. 46). Still later the good King Josiah brake down the houses of the Sodomites that were by the House of the Lord (2 Kings xxiii. 7). All this shews not only the former prevalence of the vice but also God's detestation of it, and also that of His true followers; a crime that is supremely filthy and abhorrent even in the eyes of the mass of humanity, and unnatural in every way. "After the doings of the land of Egypt, wherein ye dwelt, shall ye not do; and after the doings of the land of Canaan, whither I bring you, shall ye not do" (Lev. xviii. 3). "For in all these things the nations are defiled and the land itself vomiteth out her inhabitants" (Lev. xviii. 24). This vice was clearly common then among heathen nations; indicating a low degree of moral, social, and spiritual health and hygiene.

9. Bestiality. In this, the very lowest form of vice, the indulger degrades himself beneath the lower animals. For even these will only mate with their own kind; and abhor all other. We have no evidence in Holy Scripture of its actual occurrence or its punishment. But its possibility is shewn by the Sinaitic law, in which a prominent command, necessarily as binding on the Hebrews and humanity at large as any other Jehovistic ordinance. "Whosoever lieth with a beast shall surely be put to death" (Ex. xxii. 19). With man or woman alike "it is confusion" (Lev. xviii. 23). "If a man lie with a beast he shall surely be put to death, and ye shall slay the beast" (Lev. xx. 15). "Cursed be he that lieth with any manner of beast" (Deut. xxvii. 21). In one sense this is parallel to the sin of Onan (Gen. xxxviii. 9). In another it might beget monstrosities, even although Jehovah has put his fiat against it by causing a sexual repugnance among dissimilar animals; and also semino-ovum incompatibility. This is a crime against which human nature instinctively rebels; and causes shame and disgust except in the most debased and licentious minds. Not only God's written but also His implanted laws of Nature instinctively abhor it. As even man might so err, need we wonder that the lower animals might also. God therefore debars this by stern law, "thou shalt not let thy cattle gender with a diverse kind" (Lev. xix. 19) to avoid incongruities.

10. Lewdness and immoralities towards and unlawful marriages with neighbours and those of near kin are also strongly forbidden and legislated against by the Mosaic law; shewing God's especial abhorrence of these varied forms of vice. These are found in Levit. xviii. and also in Lev. xx. 10-21, and are best studied in the original. These different sins of lust towards kith are grievous to God, as signs of thorough depravity and impurity. And were not only punitive after the Mosaic code, but also obnoxious to His laws of heredity, which forbid and discourage the sexual connection of near relatives, because tending to decrease the population, and to cause deterioration, physical and otherwise, of the resulting offspring.

11. Irregular or unlawful marriages of another kind forbidden the Hebrews were those with heathen unbelievers, the irreligious and ungodly of other nations (Lev. xxiv. 10), whether pure or mixed aliens or captives. These aliens, foreigners, and people were

different from the Hebrews in race, colour, religion, customs, &c. This law was made to prevent them from lapsing into idolatry; prevent degeneracy of race; and to preserve the purity of Israelitish blood as a special people. The greatest object was to prevent spiritual, moral, physiological, and hygienic deterioration, degeneracy and disease. Seven of these nations are specially mentioned as to be avoided; those of Canaan, though "greater and mightier" than the Hebrews, viz., the Hittites, Girgashites, Amorites, Canaanites, Perizzites, Hivites, and Jebusites," neither shalt thou make marriages with them (Deut. vii. 3). At the same time there were many such marriages already among the Hebrews of the Wanderings, doubtless contracted in Egypt. And they often caused great mischief, as children are apt to imitate their parents even in marriage selections, and at home and in youth to follow the worse rather than the better side. At the same time, beautiful captive women were not to be sold for money, to prevent cruelty. Nor were they to be sexually dishonoured, but married (Deut. xxi. 10-14). This sequel was merciful and honourable in contrast with Deut. xxi. 11, 12, 14; which gives the outrages of the heathen of that day, and even of modern nations. Under the Mosaic law defilement and its consequences was the penalty for contracting unlawful marriages of this kind. "Take heed lest thou make a covenant with them lest it be for a snare and thou do sacrifice unto their gods and take of them daughters unto thy sons and they go a whoring after their Gods" (Ex. xxxiv. 12-17). Vice is far more easily learnt than virtue (Deut. vii. 3; Josh. xxiii. 12). It is a *facilis* decensus averni. An instance of the evil results of mixed marriages is given, no doubt designedly and for tuitional reasons, in the Pentateuch; where the heathen sons of a Hebrew woman and an Egyptian father cursed God and was stoned for what was treason under the theocracy (Lev. xxiv. 10). It is against such alliances that not only the Old Testament warned the Hebrews, but the New Testament also warns us (Lev. xxiv. 10). The marriage of Moses with an Ethiopian woman, *i.e.*, a woman of Cush, probably Zipporah, sister to Hobab, caused family trouble (Numb. xii. 1) with Miriam and Aaron. The Prophets later on also recognised the marrying of strange wives and outlandish women, as those of Ashdod, Ammon, and Moab, as an "evil" (Neh. xiii.

23-27). Malachi also animadverted against marriages among people who worshipped "strange gods" (Mal. iii. 10). So also still later on in the New Testament we are advised to marry "only in the Lord" (1 Cor. vii. 39). At the present day intermarriage with foreigners is more common; and seems to require less restriction than in earlier days; Christianity being more widespread; and differences in colour, race, &c., less considered. At the same time the Mosaic restrictions are still worthy of remembrance in the history of marriage. It is as wise now as then for Godly men or women to marry Godly persons only, who will help them to hold and not hinder their Christian faith.

12. The near of kin should not intermarry. Marriages of consanguinity are forbidden in Holy Scripture. This was not permitted in early times and by the Mosaic law; doubtless for the same reason that secular minds now assign for the same rule that now prevails. These reasons are two-fold, viz.:—

a Jehovah has wisely and intentionally implanted a natural instinct of non-affinity or silent repugnance against love or marriage between the opposite sexes of the very near of kin; a horror naturalis, against matrimonial union with a close blood relation. The love that binds parents and children is very different from that which unites wife and husband. And it is necessary and wise to draw a distinct line between the two, shewing where legitimate unions would be wise and permissible. This law was made no doubt because:—

b Of certain fully recognised and great evils. It is detrimental to the progeny, by causing deterioration and biological degeneracy; a law of Nature equally evident among the domestic animals, and fully acted on by farmers and breeders.

c And also to prevent the transmission by heredity, atavism, &c., and perhaps the intensification of abnormalities, especially in the form of disease; or the tendency to it in various forms; *e.g.*, phthisis, scrofula, gout, rheumatism, abnormal mental and moral peculiarities and traits; congenital physiological deformities and abnormalities, *e.g.*,

deaf-mutism, &c.; such bad traits being more apt to develop than good ones.

In the very early pre-Mosaic ages, when there was a more limited choice, greater latitude was permitted than later on, especially among the heathen. God wished to intensify His desire to keep the Jews isolated, select, and a favoured peculiar people; especially distinct from heathen nations, particularly neighbouring ones, the Egyptians and Canaanites, who intermarried closely. Thus before Moses we have instances of marriage with a half-sister, Abram and Sarah (Gen. xx. 12). Jocebed, daughter of Levi, mother of Miriam, Aaron, and Moses, and Amram's wife was also his aunt. Two sisters married the same man, Jacob (Gen. xxix. 26). The subsequent Mosaic law tended to prevent or lessen this by making them illegal. Socially such a marriage was inconvenient and likely to irritate both wives and induce domestic unhappiness all round. The restrictions regarding consanguineous marriages are as necessary and as binding in modern as in Mosaic days; if not more so; because as a race humanity is not increasing much, if at all, in physiological health, strength, longevity, or perfection. The law of Moses laid down the degree of affinity by blood which should not be crossed; a list which is not very dissimilar to that which now prevails. But still the Mosaic law recommended marriage in the tribe. This kept the inheritance of families in that particular tribe; the tribes, even during the Wanderings, being sufficiently numerous to permit a fair selection. "For every one of the Children of Israel shall keep himself to the inheritance of the tribe of his fathers (Numb. xxxvi. 7-8). Daughters shall not marry the sons of other tribes (Numb. xxxvi. 6-8).

13. There was still another restriction in marriage among the Hebrews. Sexually weak and defective persons were prevented by the Mosaic law from marriage or even entering the camp (Deut. xxiii. 1). This was a physiological and pathological restriction meant to prevent connubial unhappiness and also degeneracy of the species. The Scriptures had to speak plainly regarding these and similar sexual matters. Otherwise silence would have been construed into consent or indifference.

Celibacy among priests is neither inculcated nor enforced in the Holy Scriptures, earlier or later. But as these were public

characters, especial care was enjoined in wife selection. A priest's wife should be not only pure, but also not a divorced woman (Lev. xxi. 7-8). A high priest was enjoined to marry a virgin of his own people; not a widow, divorced woman, or harlot (Lev. xxi. 14-15). And they had to marry among the Hebrew people. All classes of them had to be especially careful regarding marriage; a fact indicative of the care and purity of life in deed, word, and thought which God desires of all His people, but particularly those who specially approach and minister to Him, and instruct others. "For the crown of the anointing oil of thy God is upon him" (Lev. xxi. 10-15). So in Apostolic times Deacons were to be the husbands of one wife only (1 Tim. iii. 12). And also bishops (1 Tim. iii. 2), overseers or pastors. At that time many Jews and heathen had more than one. And it is worthy of note that Paul declaimed against "forbidding to marry" by extolling celibacy as more holy and meritorious than marriage (1 Tim. iv. 3).

Impurity of body springs from and indicates impurity of mind, heart, morals, and soul. The hygienic care of the body must therefore begin with the inner man, and the private life as its source and fountain. On the other hand, God's strictness and abhorrence of sexual irregularities is equally manifested by the law which says "a bastard shall not enter into the congregation of the Lord even to his tenth generation" (Deut. xxiii. 2): a penalty which no thoughtful individual should like to have inflicted on his progeny. On the other hand the wisdom, humanity, and refinement of the Sinaitic code is shewn by the law regarding the newly-married, "he shall not go out to war, neither shall he be charged with any business but he shall be free at home one year and shall cheer up the wife which he hath taken" (Deut. xxiv. 5). Provision and laws for childless marriages formed a characteristic of the Sinaitic law, "the house of him that hath his shoe loosed" (Deut. xxv. 10). Rules were also given the Hebrews for the marriage of a widow among the brethren or kinsmen (Deut. xxv. 5-10). Every point and casualty was kept in view by the Divine Law-giver with exemplary clearness, breadth, and decision. No evasions or side issues could be permitted. These Bible-recorded restrictions impressed on the early man, and especially the Hebrews, regarding marriage, and the early history of the institution are important and interesting, because they were made for man's especial benefit and welfare by the Being best fitted to do this, by infallible knowledge, the Divinity who fashioned him, and who therefore knows him best; who guides, guards, and tries to reclaim him from the sin he has embraced, and to bless him both for time and eternity. And the whole subject is especially worth study by those who

know the Counsellor, who love, worship, and obey Him; and realize His disinterestedness in all that concerns our race.

Thus, through the whole of the Holy Scriptures, and especially the long story of the Pentateuch, particularly its Hebraic portion from Abram downwards, and the enactments of the law of Sinai, Jehovah shewed His supreme interest in and the great importance in His superlatively critical eyes of the institution of marriage, initiated by Him in Paradise (Gen. iii. 6); in human life; its outcome and happiness; and its great value as a fundamental factor in the hygiene of the home, social, and national life; as well as in the bodily, moral, mental, and spiritual welfare of the individual. Shewing that to this question of marriage, as much as to any other of the factors in the entire law, are the concluding words of Moses to the Hebrews applicable, "observe to do all the words of this law. For it is not a vain thing for you, because it is your life; and through this thing ye shall prolong your days in the land" (Deut. xxxii. 4). Clearly, therefore, the Bible teaches that to this as much as to every other life incident, public and private, the command is applicable, "ye shall not do every man whatsoever is right in his own eyes" (Deut. xii. 8). Israelites, Christians, and all men alike, should exercise the utmost prudence in a matter of such gravity, the vital one of marriage, that concerns their own weal or woe; and should consult Jehovah prayerfully, in their marital selection: and as strictly fulfil their duties and faithfulness to Him after as before its consummation; with ever increasing love and confidence. The seventh and tenth commandments of the Decalogue were no doubt instituted by Jehovah not only as hygienic preventives of moral, social, spiritual, and physiological sin, but also to safeguard His Divine and exceedingly important institution of marriage. Jehovah was and is aware of what is one of our chief human weaknesses; and of the mighty power of sin, and the hold it has of mankind.

Marriage, instituted for man at the beginning by his Maker, the Being who knows what best suits him, is thus endorsed, and commended by the Bible throughout. Some of the most attractive and instructive parts of both the Old and the New Testament consist of narratives connected with the most intimate of all the bonds between the two sexes, the home, domestic life, and its varied relations of wife, husband, mother, father, children: with their frequent alternations of sunshine and shade, joy and sorrow, such as occur in many a Christian family now. The Holy Scriptures are full of illustrations of the felicity of the home and the married state; introducing men and women in every relation of life, good, bad, and indifferent. Sketches of good women and wives like Rebecca, of bad ones like Potiphar's; of pure men like Joseph, and impure ones like King

David One and all of these stories are given with a view to shew the benefits and happiness that flow from pure lives; and the unhappy results of impurity: the felicity of the God-blest wedded life, like that of Abraham, Isaac, or Jacob; and the infelicity of the ill-assorted ones, such as Esau's (Gen. xxvi. 35). or Moses (Numb. xii. 1). There are surely few hearts that have not been drawn irresistably by perusal towards the beauty, happiness, and holiness of the married state; and even inspired by its possibilities, after reading once and again the idyllic histories that never seem to cloy, of the sinless Adam and Eve walking and talking with their Maker in that first model home, the Paradisaic Eden; or reading the entrancing stories of the lives and loves, courtships and marriages; of the home and home incidents detailed so graphically in the Bible narrative regarding Abraham and Sarai, Hagar and Ishmael, Isaac and Rebecca, Jacob, Rachel, and Leah and Laban; of Amram, Jocebed, Moses, Aaron, and Miriam, Boaz and Ruth. What Christian female heart does not desire to imitate, or male heart wish to possess the model wife described by Solomon (Prov. xxxi. 10-31)? What believing reader has not been enchanted with the graphic incidents so skilfully told that crowd the lives of the patriarchs and overshadow their homesteads. Those of Isaac and his projected sacrifice; of Ishmael and his mother nearly dying of thirst in the Desert; of Jacob and his trickery; Esau and his folly; Joseph and his cruel brethren; Miriam and her sisterly devotion; Samuel and his piety; and towering far above all the early home, life, and boyhood of the Christ; so filial to His Divine Father and ours. One and all of these actual incidents in the lives of human beings like ourselves, though in many respects not so enlightened, are meant to illustrate what home ought to be; what God would wish it to be; and what it often is now; its happiness, peace, and felicity, all breathing of that home of the future, of which it is meant to be and which we should strive to make it the type, by judicious selection of the life partner and helpmeet. On the other hand the life of Jesus, our great model in morality and exemplary celibate, is skilfully pourtrayed; not to endorse and inculcate celibacy, but to shew that it is perfectly possible for man to rise superior to human passion, and live and be tempted, yet without sin, although made and gifted and tempted like ourselves (Heb. ii. 18; Heb. iv. 15). So far from opposing marriage He condescended to grace a wedding feast and there manifest the first and one of the most remarkable of His miracles to promote the festivities. Marriage is honourable (Heb. xiii. 4). The woman should reverence her husband (Ephes. v. 33) and honour him (Est. i. 20). Wives and husbands should render each other due benevolence (Cor. vii. 3), mutual help, and love. Judicious

heaven-blest marriages promote the happiness, health, and prosperity not only of individuals but also of communities and nations, in an ever-widening circle. These are only an aggregation of homes. The happier and more hygienic they are in the aggregate so much the healthier and more prosperous is the mass.

Divorce. The question put by the Pharisees to Jesus, "Is it lawful for a man to put away his wife?" (Mat. xix. 3; Mark x. 2) we are not here to answer; the law of Hebraic and modern divorce being beyond the present enquiry. And no more need be said regarding it in the present connection than to point out that the Sinaitic law did not make divorce easy; there being various enactments on this point. This was no doubt done to endorse the sanctity of the marriage bond; and to indicate the care that ought to be exercised before contracting it. Thus one law prevented its too easy accomplishment on account of incompatability or dislike (Deut. xxiv. 1-4); and was meant to restrain a bad practice, which had gone far to annul the original law of marriage; and which still prevails among the Arabs who dissolve the tie by a mere word (Mat. v. 31). God permitted this among the Hebrews only by a legal document (Deut. xxiv. 1-3; Mark x. 4). The New Testament indicates the same, "let not a husband put away his wife" (1 Cor. vii. 11). This recommendation was especially necessary in these early days of Christianity, because divorce was often accomplished on very slight and trivial pretences (Mat. xix. 8; v. 31-32), shewing how little primary love had existed, and how little Divine advice had been followed in the selection. Paul's advice clearly implies careful selection before marriage, especially on the score of compatibility of temper. "Whom God hath joined let not man put asunder" (Mat. xix. 6; Mark x. 9) is Bible advice, which at least points to the care which should be taken before marriage not to enter into it hastily and without due care and prayer in the selection, and wise conduct after marriage. That divorced females were recommended not to marry, would also tend to prevent divorce (Mat. v. 32; xix. 9; Mark x. 11). Clearly these are matters which one and all closely concern the moral, social, and personal hygiene, health, and happiness, not only of individuals but also of communities and nations.

A brief survey of the early Biblical history of marriage and illustrations to contrast the ancient with the modern ideas and customs so far as they bear on human hygiene in its widest bearings, will not be out of place. From the facts of the original institution of marriage in Eden we are justified in deducing:—

1st. The unity of wife and husband; as the former was

developed out of the latter; both therefore being one flesh, and not separate and independent creations.

2nd. The marriage bond is or should be, not temporary and trivial, but indissoluble, except on the strongest grounds (Mat. xix. 9).

3rd. The original monogamy is the best law; namely, one husband and one wife, both self-selected, on the basis of love and Godliness (Mat. xix. 5; 1 Cor. vi. 16).

4th. Though physiologically and anatomically different, husband and wife are socially equal; each being the co-relative of the other, and the "helpmeet."

5th. Woman being originally a second formation, and made from man, she is subordinate to him (1 Cor. xi. 8-9; 1 Tim. ii. 13).

6th. The Divine term "helpmeet for him" indicates the respective duties of both (Gen. ii. 18).

The Bible story of the institution of marriage shews that corresponding to man's nature this was God's ordinance made to suit His physiological, hygienic, social, moral, mental, and spiritual necessities; which made it "not good for man to be alone" (Gen. ii. 18), and thus required a suitable partner or "helpmeet" (Gen. ii. 18), that is a counterpart with whom he might consult and converse; one who could receive and reflect his thoughts and affections; with whom he could act for the mutual good of the partnership. The bond and union were very close and Divine; "therefore shall a man leave his father and his mother and shall cleave unto his wife, and they shall be one flesh" (Gen. ii. 24).

The early marriage bond was soon considerably modified by the introduction of sin. And the woman being the first to succumb to Satan's wiles, on her fell the penalty of subordination to her husband being intensified into subjection; "he shall rule over thee" (Gen. iii. 16; 1 Cor. xiv. 34; Ephes. v. 22-23; 1 Tim. ii. 12). After this, and no doubt from the same cause, namely the fall and sin, corrupt usages soon crept into this Divine institution, originally made for man's weal and happiness. Its unity was impaired by polygamy, apparently first begun by the depraved Cainites (Gen. iv. 19): while its purity was deteriorated by the "sons of God," that is the Godly Sethites, intermarrying with the daughters of man, that is the irreligious Cainites (Gen. vi. 2). Polygamy was never authoritively allowed by Heaven; but Jehovah clearly tolerated it among the patriarchs. At least it was never distinctly forbidden. The same may also be said of concubines, that is secondary or inferior wives. But their children did not inherit property except on failure of regular issue (Gen. xxv. 5-6). Necessarily, when polygamy was prevalent, though not God-sanctioned, the

position of a wife was not quite so honourable as among us. On the other hand concubinage was deemed less degraded than it is now, and that because both were adopted, not so much from pure lust as from the natural semi-religious desire of both sexes to have children in the family, even if not their own, as in the case of Sarah, who promoted the marriage of Abram and Hagar (Gen. xvi. 2), and other cases, such as Rachel and Bilhah (Gen. xxx. 3; Leah and Zilpah (Gen. xxx. 9); who regarded the offspring as their own, and partially adopted them.

The preliminaries of marriage were considerably different then; there being no previous and sometimes lengthy espousal, betrothal, or solemn promise of marriage between the two chief contracting parties, either in writing or by delivery of a piece of silver (Deut. xx. 7; Judges xiv. 8). Among the early Hebrews, as in Eastern countries generally, marriage was too often regarded as a sort of purchase of woman by the husband. The wife brought a portion to her husband; so the husband was obliged to give her or her parents money in lieu of this (Gen. xxix. 18; xxxiv. 12; Sam. xviii. 25). This savours little of the Biblical ideal of marriage on the twin basis of holiness and love; and little resembles the Biblical illustrations presented to us; as those of Abraham and Sarah, Isaac and Rebecca, Jacob and Rachel, &c., &c.; that begat so much felicity and contributed so largely to the hygiene, health, happiness, and prosperity of their lives. Nor had they in early times any particular form of marriage ceremony, as we have at the present day. Only mutual consent, followed by consummation; the nuptial ceremonies being sometimes celebrated with great festivities and splendour (Mat. xxv.). The Levirite law (Deut. xxv. 5), by which if a man died childless his brother had to marry the widow, prevailed in a very early age (Gen. xxxviii. 8), viz., in the family of Jacob's son, Judah (Gen. xxxviii. 8). Moreover, the sacredness of marriage is assured and provided for by the Sinaitic law, which enforced it in the case of the poor Hebrew slave (Ex. xxi. 7); or Gentile captives taken in war (Deut. xxi. 10). Even these were not to be sexually degraded; their social and moral hygiene were to be respected.

All through the long ages of the Old Testament history marriage was regarded as the indisputable privilege and indispensable duty and a sacred obligation incumbent on every man, and celibacy deemed a great reproach. Nor under the Mosaic dispensation was it ever deemed likely to prevent the attainment of a high degree of holiness, by distracting the attention and mind from religion and God. Shortly before the Christian era, and especially during the life and ministry of Christ, a change began in the aspects of marriage. Then the Essenes, Therapeutae, Gnostics, and Eucratites arose, who either re-

stricted or avoided marriage or entered it under certain conditions. Their philosophic tenets and their outcome were condemned by Paul (Col. ii. 16-23; 1 Tim. iv. 31); while he admits the general propriety of marriage and even enforces it; whereas he only recommends abstinence therefrom as a sense of duty (Mat. xix. 12; 1 Cor. vii. 8-26). Here we have chiefly to do with the Hebrews, a nation meant to be the light of the world of that day and its example; and not with the outside heathen nations. The early Jews were bound by the Sinaitic law by certain restrictions regarding marriage with others of different blood, colour, language, creed, &c., *e.g.*, with the Canaanites (Deut. vii. 3), Ishmaelites (1 Chron. ii. 17), Edomites (1 Kings xi. 1), Moabites (1 Kings xi. 1), Egyptians (1 Kings xi. 4; 1 Chron. ii. 33); Phœnicians (1 Kings xvi. 3), Tyrians (1 Kings vii. 14): on account of their idolatry. The only restriction imposed by the Christian religion is that the Godly should only marry the Godly. The laws of old were mainly meant to keep the Israelites in Godly tracks, pure in blood, and free from sin, especially that of idolatry. Jews often break this law at the present day. So indeed do Christians Bible advice: according to the strength of their instinctive feelings of patriotic or Godly exclusiveness; which form one of the bonds of every social community and individual views regarding social, and religious intercourse and duty, that every individual must solve for himself. We must remember that some of the strongest and most important nations in the world, politically, socially, physically, and mentally, are the result of a judicious intermixture of races, notably the two chief Anglo-Saxon races of the world. The laws relating to marriage and consanguinity among the Israelites are especially worth study and imitation, for they are Divine; and because our own modern secular restrictions are based on them.

The primitive Edenic monogamy; one woman for one man, and these their own choice; that which Christians now generally practice is still the only God-appointed and therefore only wise sexual relationship between the human male and female. It is that which is best for the health, happiness, prosperity, longevity, virility, and continuance of the race. Christians and Christian custom are thus supported by Holy Writ. Whenever Christians meet with a difficulty or a doubt on any subject they prefer to have it settled, as in this instance, by God's Word. Jehovah's message in the Holy Scriptures of the new dispensation is the same as His implied advice when He made Eve for Adam; as his suitable helpmeet, complement, and second self, to love and cherish in the Lord. "Every good and perfect gift is from above, and cometh down from the Father of Lights with whom is no variableness, neither shadow of turning" (Jas. i. 7).

CHAPTER XI

CLIMATE, WEATHER, AND SEASON

"Taketh a garment in cold weather" (Prov. xxv. 20; viii. 28; Job. viii. 28).

The gaseous atmosphere which envelopes our abode, the earth, and in which we physically and physiologically live, move, and have our being, is to us one of the most important departments of our sublunary abode; inasmuch as without it we could not very long exist. It is necessary to give us breath. And that again is the "breath of *life*" to us because of the oxygen it contains, absorbed first by the blood from the lungs, to be incorporated thereby and added to the bodily tissues, or employed in promoting the functions of our many widely different, very busy, and unceasingly active organs; which in their entirety go to form our human frame.

The nature and composition of the atmosphere have already been given under the heading of Air (Part 2, Chap. 4). But this medium or ideal atmosphere often varies, and is not always exactly like the standard we have given. Several different factors contribute to this result, so that nowhere is the atmosphere very long alike and similarly constituted, physically or chemically, even at the same place in any given part of the globe. The chief of the factors now spoken of, and the main changes they effect, are the following:—

1. *Latitude* makes the *temperature* of the air range from high equatorial heat to great polar cold.
2. *Altitude* makes the aerial *caloric* range from that of the sea level to the intense cold of mountain tops and balloon invaded regions.
3. *Insular* and *littoral* and *oceanic* position make the *moisture* of the air materially greater than in inland regions. Latitude does the same; equatorial moisture being greater than temperate and especially polar regions.
4. *Altitude* and *latitude* both make the *density* of the air and its most vital constituent, oxygen, to vary: the air and its oxygen, bulk for bulk, being heaviest near the earth's surface and towards the poles; and lightest on mountain tops and towards the equator.

5. Various physical conditions affect the *stability* of the air, but mainly:—
   - *a* The greater heat of the sun's direct rays at the equator and the lower temperature of the oblique rays at the pole.
   - *b* The motions of the earth on its axis and orbit.
   - *c* The rotundity of the globe.
   - *d* The air being heated not directly by the sun's rays but by radiation from the earth's surface.
   - *e* The more equable and higher heat of the sea than the land.

   These cause the air to be never long at rest by generating different winds, trade, monsoon, sea and land, &c., &c.
6. The purity, physical and chemical constitution of the air are often altered, especially in the lowest and densest stratum in which we live, by dust, alien gases, and vapours derived from the earth itself or its animal and vegetable life.
7. The amount of *light* is constantly varying by means of night and day, cloud, &c. So are the *electric* and *magnetic* conditions of the atmosphere.

The study of these different factors of the atmosphere on man forms the interesting and important theme of meteorology; a necessarily complex theme, because it involves a study of the action, re-action, and inter-action of two very unstable and many branched groups of factors, the physical of the air, and the physiological of the body. These constantly varying states of the weather and of climate, as indicated by the barometer, dry and wet thermometer, rain and wind gauges, &c., &c., are all matters of great moment to humanity, not solely from motives of comfort and amusement, but for higher sanitary and sanatory objects, and their influence on human health, disease, and even life: inasmuch as they are well known to increase or decrease the prevailing sickness and mortality; to lengthen life or shorten it; to increase our vitality or lessen it, according to their salubrity, or the reverse: and according to whether the weather, climate, or season is favourable to life or inimical to it. These meteorological agencies and sub-agencies affect both healthy and morbid life: they act on the body both when sickness is absent or when it is present. A healthy season, climate, or good weather increases our present health and stored vitality. Unhealthy ones lessen both, increase our morbific tendencies, and act detrimentally both on our health and spirits, mind, and even our higher nature. Climate, season, and weather are thus powerful, unceasing, and ever-present *hygienic* factors in pre-

serving and restoring health, as they are also potent, morbific ones in causing disease and destroying life. The direct and indirect influence of one or other of these agencies or the factors which combine to regulate them on the health and the career not only of individuals but also on those of families, nations, and the human race, will be obvious. The climate, season, and weather change incidental to any particular coast, city, or country have a material influence on its prosperity and history, a matter which of course hinges on its population. It thus becomes an important object to know why and how these various meteorological conditions and factors act on our bodies and on its various physiological and pathological manifestations and functions; with the practical object of trying if we can avoid evil or increase beneficent consequences such as are likely to arise therefrom. Certain climates, seasons, and weathers are powerful agents in causing disease. Others again are equally potent, therapeutic, or healing agents. While others again are, like those last alluded to, long and favourably known as valuable hygienic or sanitary, that is health-preserving, invigorating and disease-opposing agencies, and hygienic helps both to the physician and the patient he desires to aid.

Indeed, climate, weather, and season are agents of such power for good or for evil, that without the former, health, even in the strongest frame, could not be long maintained; even when all other hygienic factors, food, drink, rest, &c., are favourable. So also, on the other hand, if the former are satisfactory the frame is much longer able to withstand the unhealthy influences of other, and even a combination of other unsanitary agencies, such as those now alluded to.

Let us endeavour to examine why it is so. To do this a knowledge of certain physiological facts that specially relate to this subject are necessary. The many vital operations carried on in living bodies, both of the vegetable and animal worlds, especially in the latter, and in none more than in the human frame; for example, digestion, assimilation, secretion, excretion, innervation, muscular contraction, seeing, hearing, tasting, smelling, feeling, thinking, and all other corporeal functions, cerebral and otherwise, require certain external physical conditions for their healthy or normal manifestation; and also certain internal or bodily conditions. Of the latter a certain *temperature* both in the acting organ and in the body generally, is one of the most important, and indeed indispensable. In man this temperature ranges from 97½° F. to 103° F.; and averages 98½° F. in the heart, lungs, and centre of the body; although for obvious reasons, it is slightly and often some degrees lower towards the surface and the extremities, these being furthest from the heat-making centres. In birds, which are all warm-

blooded, the necessary caloric is higher than this; and sometimes as in the smaller varieties, mounts to 114¼° F. In reptiles, which are cold-blooded, it is lower, namely, 82½° F. While again in fishes it is only a few degrees above that of the fluid medium, fresh or salt, in which they swim. In the invertebrata, such as insects and other varieties, it is still less; and generally, as with fishes, about equals or is only a few degrees above the temperature of the medium in which the creature lives, whether that is the air, earth, or water. This bodily temperature varies slightly according to different physiological and hygienic conditions of the body itself. Thus, *exercise* makes it rise slightly. So it is somewhat greater after a *meal*. As to *age* we find it slightly higher in infancy, and lower in extremely old people. The *period* of the day makes it alter; for we find it highest from 5 to 8 p.m.; and lowest from 2 to 6 p.m. So also season, weather, and climate make it vary; for in summer it is slightly raised; as it is also in warm days; and again in tropical climates. These various slight modifications of the temperature of the human body are readily understood and easily explained on physiological principles. The relation of this bodily temperature, especially that of mankind, to the temperature of the external air, and to its other physical conditions of moisture, pressure, electricity, magnetism, actinism, and chemical constitution, in different regions, climates, seasons, and periods of the day or night, is important; and one of the most abstruse physiological and therefore hygienic studies.

When from any cause, arising either in the body itself, physiological or pathological; or one coming from some cause external to it and meteorological, this temperature is either raised or reduced, even if only by a few degrees; the function of the organ or part becomes depressed. At a higher or lower temperature it ceases, and not only the part itself, but even the entire animal dies. This local or general alteration in the blood-heat is often the first appreciable sign of disease. And it is one which is sometimes serious, even before manifest indisposition is felt; thereby making it a very satisfactory diagnostic sign for the physician and surgeon. In man this incipient morbific impairment of normal function, either on the side of decrease or increase, happens when either amount of change rises to 3° or 4° F. Again, there is absolute danger when the bodily temperature rises to or goes above 106° F.; and in children 108½° F.: or when it falls to or goes below 95° F. And a decrease is almost always fatal if the temperature rises to and more especially if it goes above 108° F.; and also when it falls to or goes under 93° F. The utmost deviation of bodily temperature consistent with the maintenance of life may be given at between 90° F. and 110° F., *i.e.*, a range of 20° F. When it

approaches either limit death becomes imminent. In disease, however, the temperature is often and indeed usually changed; and not unfrequently passes these limits. Thus it may fall to 71·6° F. in scarlatina; or to 77° F. in morbus cœruleus or Asiatic cholera. In the latter it has been noticed at 89·6° F. in the axilla; and 104° F. in the interior of the body. In typhus, scarlatina, and other infectious diseases, it may rise to 107½° F. and in children to 108½° F. Again, it has been seen to rise to 108° F. in sun or heat stroke; to 110° F. and 111° F. in injuries of the spinal cord; and 112½° F. in tetanus.

This caloric is generated in and by the body itself; and it is largely independent of external or aerial temperature. In fact one of the most important of all the vital functions of living animals is to maintain the heat of its different tissues, organs, and the body generally at or near its own proper standard. When they fail to do this fully, the animal, its several organs and parts, and their functions languish. When they fail to accomplish this entirely, even for a very brief period, life can no longer go on, and they die. The function of calorification is most wonderful in man, the animal which possesses by far the most complex of all of Nature's many vitalized machines. Man alone of these is cosmopolitan; and has the vital resilience to maintain his bodily temperature under many and wide changes of aerial temperature, and thereby to live and enjoy comfort and health and life in almost every part of the habitable globe, which few or perhaps no other animal can.

If man lived in a medium atmosphere or in one which possessed an unvarying temperature of 98½° F., that is a temperature identical with that of the human body, health, and life, would be materially simplified: and one of the most frequent sources of discomfort, disease, and even death would be removed from our midst. But while the bodily temperature is pretty regular, that of the atmosphere in which we live and from which we derive one of the most urgent and vital necessities of life, namely, oxygen, is not of a uniform temperature, but the reverse; and indeed varies considerably even within brief and limited localities and periods. Thus, night is everywhere colder than day; winter, than spring, summer, and autumn; polar cold than temperate, and both than tropical regions. So that at no two periods of time, and in no two spots of the globe in which man lives or over which he may travel, is he subject to an unvarying degree of heat or cold. The atmospheric temperature to which mankind is subjected is thus constantly changing from climatic, seasonal, or weather variations; and ranges from—81° F. below zero (as at Werkogansk in Siberia), that is from 113°F. below freezing point to at least 120° F. (interior of Australia). These figures give an extreme range of

201° F. to which a traveller, for example, may be subjected in a comparatively short space of time. This also shews that different races are subjected to very different temperatures. Those who live in the tropics and in equatorial regions encounter great heat; those of Polar regions great cold; and those of the temperate zone an intermediate temperature. But again the inhabitants of all three regions, arctic, temperate and equatorial, are subjected to another variety of climate, namely, that caused everywhere by the annual change of the seasons. This in temperate climates is divided into spring, summer, autumn, and winter: and in the warmer latitudes into the wet and the dry seasons. Moreover, man is everywhere exposed to another variety of climate, namely, that caused by the alternation of night and day. Lastly, he has still another to encounter; namely, those constant changes known by the name of "weather variations," which occur in all places, at any hour of the night or day, and during every part of the year.

In all of these conditions, just as there are several factors which combine to form the atmospheric changes in question, whether of season, climate, or weather, so there are several which combine to form the sum of the physiological changes they induce in the human body. The former or physical changes in the air include temperature, moisture, motion, density, electricity, magnetism, actinism, and chemistry. Of these the main factor is unquestionably temperature. It is this which most influences our personal comfort and health; that is our health or life and their hygiene. Changes in the temperature of the air, especially if sudden and great, are the most potent, sanitary, or unsanitary factors in our life.

Fortunately the human frame has been fashioned with sufficient resilience to meet and cope against these emergencies; and sufficient to keep the just balance of life and health under a reasonable amount of atmospheric change. Nay, it has more adaptability of this sort than has the body of any other animal; and can bear a greater range both of temperature and climate. Man alone can exist in almost any region of the globe. One of the greatest of the many great marvels in human physiology is the power with which the body has been endowed to maintain its caloric equably under so many different circumstances, including rest, exercise, excitement, labour, and especially the widely varying ones of atmospheric changes. In the intense cold of Arctic and Antarctic regions, and in the fierce heat of the equator, it maintains the same equable average.

In order to better understand how the bodily temperature is kept at or near the same average under such varying circumstances it is necessary to consider firstly, how the temperature

of the body is produced and maintained. No doubt, as with every process and function in the body the *nervous system*, that is the brain, spinal cord, and the universally distributed nerves, exercise a most important influence in the production of body heat, by acting as the controlling and regulating agent, as it also does for those other physiological changes that flow from aerial thermometric variations. But at the same time it cannot be doubted that the effect in question is directly and chiefly induced by the chemico-physiological action which takes place between the oxygen of the air introduced into the blood by lung respiration, on the one hand; and on the other the heat-producing material, especially carbon and hydrogen, which exist in the blood in solution, derived from the effete tissues adjoining the capillaries all over the body. This chemical action is strongest in the lungs, the chief inlet for oxygen. But it doubtless goes on in the capillaries all over the body. At any rate the temperature is highest in the former; higher in the blood (101° F.); lower in the tissues (98½° F.); and lowest of all in the extremities (93° F.—90° F.); that is in those parts which are furthest from the blood-aerating, blood-oxygenating, blood-heating lungs: and from the heart which first receives it and propels it on to where it has its special double tissue-feeding and tissue-resolving functions to perform. The caloric thus generated in and by or near the blood and blood-vessels is diffused and thereby equalized in the latter; and then it is distributed by these tubes to every part of the body. In order to effect this and to carry more or less heat to the surface of the body, graduated in quantity according to the varying temperature of the air, the factor most apt of all to affect it; the human frame is endowed by Nature with a beautiful compensatory system. Thus in temperate or cold regions, when the body caloric is rapidly carried off from the skin by the cooler external air, not only are the oxygen-inhaling lung function but also the calorificient blood processes increased by Nature, causing us to instinctively desire and consume more heat-producing food and breathe oxygen giving air to chemically decompose this and thereby generate caloric. But the cutaneous capillaries are also less full of blood, and therefore secrete less, insensible and sensible perspiration; and thereby do not radiate the surplus heat by the cooling, physical process of evaporation. Again in warm regions the opposite physical and physiological phenomena take place. We inhale less air; thereby less oxygenation goes on in the blood. Moreover Nature impels us to take less heat-producing food, and altogether reduce the ingesta. And again, by a wise adaptation of means to ends more blood is sent to the skin and its capillaries to supply the greatly increased perspiration; the constant evaporation of

which, after a well-known physiological law, cools not only the surface, but also through it the entire mass of the blood and the body. These different changes are doubtless originated and controlled by the nervous net-work of the skin, especially its vaso-motor nerves, that is by the minute fibrillæ distributed on the blood-vessels and capillaries, which, from their proximity to the surface, are necessarily the first to indicate to the controlling nerve centres changes in the aerial temperature.

In health an accurate balance is kept up between these different functions of the internal organs, lungs, liver, &c., and the external skin, during different changes of temperature, no matter whether the latter are caused by weather, season, or climatic variations. The different organs both of external and internal parts, and their blood-vessels and capillaries, all possess a certain resilience of function which enables them to meet the varying calls on their circulation. This consists mainly in a greater or less copious blood-supply. In warm days, seasons, or climates the external or cutaneous capillaries and blood-vessels are fuller of blood and more replete than they are in colder days, periods, or places. While again in the latter the blood is more massed towards and accumulated in internal parts, organs, and centres, especially in the larger more vascular ones, the lungs, liver, spleen, and abdominal viscera. Thus in warm atmospheres the external organs are more congested and fuller of blood; and the internal ones less so than they are in cold ones. Again, in cold atmospheres the reverse occurs; the external organs are more depleted or emptied of blood than they are in warm atmospheres; the balance of blood going to flood internal organs.

Now when, either in cold or in warm atmospheres the different internal and external organs bear this constantly varying influx or depletion of blood, this constant unceasing fluctuation; perpetual ebb and flow, apogee and perigee, alternate congestion and depletion; a condition which varies with every being, with each change of temperature, is slight when this is small, and large when this is great. And, when all of the different bodily organs and functions continue to be properly performed, then the individual continues to be in what is termed good health and vigour; the different physiological processes involved are hygienic or sanitary. They are meant and ordained for the purpose of preserving health and warding off disease. Without them, indeed, health would not be long maintained. But, on the other hand, so important are they that when any one of the organs or parts that take part in these processes is either hereditarily or acquiredly weak and predisposed to disease; or when a too sudden reduction or increase of the atmospheric temperature is not met by suitable sanitary pre-

cautions, as to change of clothing, firing, food, and exposure, to meet the emergency, and either add to or subtract from the bodily heat, the blood influx sent from one part to another is too great, and the local circulation thereby suddenly overstrained, blocked up and impeded, super-congestion and its advanced stage, namely inflammation, or disease, in some shape or another results. This is a frequent cause of some of the most important and deadly ailments to which the human race is liable in every clime and country.

The great influence of temperature on health is shewn in various ways; and by nothing better than by the effect it has both in producing and in aggravating disease. Thus in our own temperate, as well as in tropical and Arctic ones, the amount of sickness rises and falls with the temperature. The mortality holds the inverse ratio. So that a hot summer is therefore a very sickly one from certain prevalent diseases, such as cholera, diarrhœa, dysentery, hepatic and febrile affections, especially among the young and middle aged. A cold winter is very fatal from certain other ailments, such as pneumonia, bronchitis, and lung ailments, which, moreover, are very prevalent among infants and aged people. The unhealthy influence of heat is still more evident when any unsanitary conditions prevail. This is shewn thus, that now, as in former times, when a village, town, or city is uncleanly during the summer season both the amount of sickness and death-rate are high. Whereas in clean places and more sanitary times the maximum death-rate is in the winter. Again, in the middle temperate zone the coldest months are the most fatal. Next to them rank the hot months. The intermediate ones are the least fatal; a fact which shews indirectly the kind of climate best suited for us, namely, the intermediate part of the middle or temperate zone. The following figures will shew the dire effects of a low temperature in destroying life:—

TABLE XIII

Contrast between Heat and Cold	Consumption	Other Lung Diseases	Heart Diseases	Brain Diseases	Other Diseases
Deaths in 10 COLD days— Mean daily temp. 34° Fahr. ,, night ,, 27° ,,	232	502	73	170	867
Deaths in 10 WARM days— Mean daily temp. 51° Fahr. ,, night ,, 47° ,,	163	394	51	172	725

From this it appears that a fall of only 28° F. in temperature raises the proportionate death-rate from 15 to 18. Any considerable fall of temperature during the colder months of the year is always followed by a corresponding rise in the death-rate, and a greater increase in the sick rate. For example, in the week ending December 19, 1863, London shewed 1,291 deaths. After a week of severe frost the number rose to 1,798; and in the following week to 2,427; the increase being due to severe cold. The same fact is also proved by the fact that after from 20 to 40 years of age the mortality from colds increases in a nearly definite ratio with advancing years. A hot wave will also increase the death-rate during summer. This is proved by the following facts gleaned from the current medical literature of the day. During July 4, 1882, the death-rate in New York was 150. On the fifth it was 139; and next day 205, a large proportion of whom were children under 5 years of age in crowded tenement districts. The cause of this increase was a sudden and great rise of aerial temperature. Indeed it may be laid down as an axiom that cold probably produces year by year, in all countries, seasons, and ages, more disease and deaths than any other single predisposing and existing morbific cause. The same thing is shewn by climatic changes inducing climatic or regional diseases of very different types. Thus, tropical and sub-tropical ailments are severe intermittents and remittents, yellow fever, diarrhœa, dysentery, cholera, liver diseases. On the other hand Polar diseases are, catarrhs, influenza, respiratory diseases, scurvy. Again, the chief diseases of the temperate zone are, continued fever, typhoid, pulmonary consumption, mild intermittents and remittents, rheumatism, cutaneous diseases. A further proof of the fact here illustrated is this, that these diseases are seen in their worst form when the inhabitants of one goes to another zone. For example, when a native of the temperate goes to the Arctic or the torrid zone; or vice versa. And especially when the inhabitants of the two extreme climates interchange localities. The severity of the strain of extreme climates on the human body is also shewn very strikingly by the rapidly increasing death-rate, according as the range between the hot July and the cooler January weather of the place increases. Thus, the mortality is 8 per cent. greater in England than in Scotland, because the latter is more insular and equable in temperature. And, for the same reason, the death-rate increases the more we penetrate into the adjacent continent of Europe. To these sanitary or unsanitary effects of *temperature* the minor but still potent ones of atmospheric *moisture*, pressure, electricity, and ozone, must also be super-added. But into this it is beyond the scope of these pages to enter.

What has been already said will render it apparent that during the frequent changes of temperature to which all mankind are liable from hour to hour, day to day, season to season, or travelling from clime to clime, how important it is to understand the nature of these physiological changes: and above all that this necessarily creates a definite and important department of hygiene, and renders special modifications necessary in our food, clothing, heating, housing, &c. It is therefore essential that we should know how to practically apply this knowledge, to promote our individual and public sanitary interests by judiciously guiding our food, clothing, heating, shelter, &c., in accordance therewith so as to promote, and neither oppose nor too greatly increase these healthy physiological phenomena so as to make them unhealthy, *i.e.*, morbid or pathological. Because this untoward result not only disturbs our comfort but also weakens the body; and thus renders it prone to attack by other diseases; and above all tends of itself to originate serious complications.

This strictly automatic self-poise and regulation of the body temperature is maintained from hour to hour, day to day, and year to year, during the long period of our lives, by a combination of circumstances. In order to accomplish and carry it on certain conditions are necessary, thus:—

1st. A full supply of pure air. Heat is generated in the body, as it is out of the body by a chemical process. And,

2nd. Since this is completed by a physiological form of chemical action not witnessed in inorganic matter, namely, by a reaction between the living fluids and tissues of the body on the one hand, and the physically inert air, the process partakes of physiological action, and hence is termed chemico-physiological. This action, which produces the heat of the living body, consists in the union and decomposition of the particles of animal tissue with and by inert air, or, strictly speaking, with the oxygen which forms 21 per cent. of this. This action is of two distinct kinds; namely:—

a That induced by the ordinary operations of life. Every act and function carried on in the body, whether glandular secretion, muscular motion, brain and nerve action, digestion, assimilation, and so on, is accompanied by and in fact consists of or results in a chemico-physiological union of different cells, fibres, or particles of living structure or their contents with oxygen gas. The

several vital manifestations now spoken of are in fact merely an outcome and result of that chemico-physiological union.

b The union of the oxygen of the air in the blood with certain hydro-carbonaceous food ingredients taken into that fluid during the digestive process for the purpose of heat generation.

Thus it happens that from birth to death life involves a constant slow oxygenation or combustion of animal tissue. To properly effect this certain conditions are necessary. Thus:—

1st. A full supply of oxygen. With this no other gas or noxious vapour must be admixed, at least in deleterious quantity, to retard or interfere with the process. With one exception, for reasons which need not be entered into here, the oxygen of the air which animals breathe is diluted with 79 per cent. of the inert gas, nitrogen. In short, the air must be both chemically and physically pure; and, above all, must contain the full and natural amount, viz., 21 per cent. of oxygen, as mentioned in Chap. 4. Again, because it is necessary that the body should manufacture more heat for itself in certain conditions and places than in others, the amount of air which it takes in and consumes for this purpose necessarily varies. Hence in cold regions or in cold seasons, and on cold days or periods of the day, the lungs breathe deeper and faster and thus inhale more pure air and oxygen than they do in warm latitudes, days, or places. The amount of air which the lungs consume is thus daily, nay hourly, changing in accordance with their vital necessities and those of the body, whose instruments and coadjutors they are, and whose wants they indicate by the respiratory desire (besoin respirer). And, for the same reason, the inhabitants of the tropics use less air and oxygen than those of temperate zones; and these, again, than those of Arctic regions.

2nd. A full supply of proper and good food is another necessity for heat generation. The constant activity of the different vital processes above mentioned; which produce heat by the union all over the body of the different cells, fibres, and particles or fluids of the body with oxygen, is accomplished by a continual destruction of the implicated parts. Hence these must be perpetually renewed or replaced to keep the body up to its normal standard of bulk and vitality. Otherwise the vital machine would very soon stop

when the different tissues and cells were expended. It is interesting to know that recent research has shewn that when death is induced by starvation it is accomplished by want of the proper caloric generating fuel and the resulting lowering of the animal heat to a point below which Nature has limited her healthy physiological phenomena. And, in order to accomplish this necessary reconstruction of body tissue, food is clearly as needful as wood, bricks, stone, and mortar are towards the erection and maintenance of an ordinary dwelling. As good material is required to make the latter perfectly acceptable, so it is as necessary, if we would build up a strong and healthy body, that our food should be sufficient in quantity, pure in quality, and of the proper kind, as mentioned in Chap. 2. Moreover, and for the same reason, good food produces more heat for the same amount as inferior food. Just as good is better than bad or inferior coal for combustion; because it supplies more of the calorifying elements and leaves less waste or refuse.

Two kinds of food are especially necessary for heat-making. These are:—

a Tissue-forming food to rebuild the constantly wasting tissues reduced by Nature from their complex combinations to their original simple chemical elements by the unceasing physiological functions of our different organs, tissues, and parts, and all accompanied by and involving the production of heat.

b Heat-forming food, to meet the constant waste caused by the never-ceasing but variable chemico-physiological heat-making operations carried on all over the body for the sole purpose of producing its necessary caloric.

But while a certain and pretty equable amount of constructive food is necessary to keep the body bulk up to its normal standard, the amount of the second or calorifacient kind required varies constantly with the heat necessary to be kept up: and hence is less in warm than in cold regions, places, or days, in summer than in winter, as shewn in Chap. 2. A different kind is also required in warm than in cold temperatures: more fat in the latter and more vegetable in the former. This accounts for the more animal and fatty food consumed by and necessary for the inhabitants of Arctic; the lighter vegetable food necessary for the natives of tropical regions; and the intermediate or animo-vegetal diet that we and other natives of the middle or temperate zone indulge in.

3rd. Artificial heat or cold. Sometimes in the great cold of certain regions, seasons, or times, the body, even in health, cannot keep its temperature up to the normal standard, even when the food and air supply are all that can be desired. Nature has then to be assisted. In other cases the heat encountered is greater than the body has been accustomed to, and the body temperature is apt to become too high, notwithstanding the marvellous self-poise of the system. And, therefore, while under the former circumstances the heat-generating power requires to be aided: in the latter it has to be regulated and suppressed. Both objects are accomplished by artificial means. The former aim we fulfil by the aid of fires, shelter, houses: and we further both by suitable clothing and other means. Thus:—

1st. In great cold we keep our body heat up to the standard consistent with comfort, health, and life, by artificial heat, produced in various ways; as by fires, shelter, houses, and other means needless to describe here. The amount of heat thus produced should vary with the necessities of each case, and should be neither too small to keep the body temperature below par; nor too high to excite and keep it above par. Again, in great heat, we have lightly built and more open houses or tents to keep the air and thereby our bodies as cool as possible.

2nd. Additional thicker and warmer clothing is also necessary, such as flannels and furs, in cold climates and seasons. In warm ones lighter and especially white clothing, as mentioned in Chap. 8, help materially to keep the body temperature down. So does keeping in the open air in a breeze, especially in spots sheltered from the sun; the use of punkah's and fans to produce artificial air currents; and various cooling drinks taken moderately, merely to produce gentle perspiration, the special excretion which helps to cool and chill the skin by the natural mode, evaporation.

That these are not immaterial subjects of study, even for non-professional minds, is shewn by the fact that the regulation of our body heat and cold is largely in our individual control: and thus that the many serious and frequent pathological re-

sults and diseases that flow from an interruption of some sort in the calorifying processes of the human body are largely preventible by ordinary common-sense hygienic precautions. Indeed, the list includes some of the most frequent, tedious, and fatal diseases to which the race is subject. To illustrate this, and to shew the process by which these are induced; and with a special ulterior view to give a clue to their avoidance, a few simple examples may be cited.

1st. When the body is suddenly subjected to a cold atmosphere, the skin in contact with the air necessarily first becomes lowered in temperature. This chilling of the surface drives the blood which permeates it from the fine network of cutaneous capillaries, and blanches the surface. The blood so displaced is sent inward to congest and fill the blood vessels of internal organs and parts, especially the very vascular ones, *e.g.*, the lungs, kidneys, liver, bowels, &c., and especially the organs and parts which possess a loose, delicate, vascular structure, allowing their vessels and capillaries to expand and meet this tide wave of blood. Now, though these organs are endowed with great physiological resilience of structure and function that enables them to meet and accommodate themselves to these plethoric vascular emergencies; and with great adaptability, both structural and functional, especially when the change is comparatively slow and gradual; but often, too, especially in strong persons, when the climatic change and its results are comparatively sudden: still this strain is often apt, and not unfrequently does overstep the bounds of normal action. Then, both the effect and its result cease to be physiological, and become pathological. Healthy normal function then merges into disease; and healthy structure converted into morbid tissue. It ceases to be a natural hygienic or sanitary flushing with blood, and becomes over-distension, engorgement, stagnation, passive congestion, and ultimately, in its worst forms, inflammatory action. In this manner doubtless arise perhaps half of the inflammatory diseases from which mankind suffers in all quarters of the globe, at all ages, and in an infinite variety of forms. It is thus that we originate inflammations of the lungs, such as bronchitis, pleurisy, pneumonia; inflammations of the throat, cynanche, tonsillitis, parotitis, laryngitis, pharyngitis; inflammations of the liver, kidneys, bowels, in the various forms of peritonitis, enteritis, diarrhœa, dysentery; and also many other of the most

frequent and dangerous ailments that afflict our race in every clime.

It is of great practical importance towards the furtherance of popular health-preservation to know how this occurs. These morbid phenomena usually arise under two circumstances: thus:—

a When any of the implicated organs are weak, and therefore predisposed to inflammatory or other diseases, either from hereditary tendency or previous inflammation, both conditions of frequent occurrence. In these cases the blood overcrowds and distends the weak vessels; throws too great strain on them and on the function of the organ. This the organ has not sufficient resilience to overcome; and congestion, inflammation, and their consequences result.

b When, either with or without this hereditary or acquired local weakness of parts or organs, an individual, from ignorance, carelessness, or bravado, forgets ordinary common-sense precautions, and the necessary laws of health; and does this either by neglecting his food; that is the heat-generating pabulum; or else his clothing, *i.e.*, his heat retaining appliances; or the heat-helping agencies of fires, house shelter, &c. These one and all not only permit the bodily temperature and thereby the vitality to fall below the nomal average, chill the skin over much; and send too much blood to crowd and block internal organs. And this state of matters the latter, with reduced vitality, cannot accommodate themselves to; so that congestion or inflammation and their train of evils follow, especially in weak predisposed parts.

2nd. The results of subjection to the opposite order of things, namely, exposure to warm atmospheres after cold ones, especially if this is sudden, are often equally serious, though generally produced in a different way: thus:—

a Not unfrequently the increased blood-flow of the skin and its vicinity congests and inflames these by a greater and quicker influx than the capillaries can at once accommodate themselves to. Hence arise the prickly heat, erythema, and other skin ailments so common, and for an obvious reason, especially frequent on first exposure to warm weather, hot seasons, and sultry climates.

b In most cases, however, disease is induced in the second of the above ways, in which it

arises in cold atmospheres, namely, by neglecting ordinary sanitary precautions, and usually by suddenly checking the perspiration and the accompanying necessary and natural cooling process: by sitting, for example, in a tempting draught: or using iced water and similar cold drinks: taking cold or shower baths and so on too freely: and thus opposing Nature's sanitary methods, reducing the cutaneous temperature too much, thereby chilling the surface, sending the blood which distends its capillaries inwards to flood organs which Nature ordains and demands should then have their blood supply and their special function reduced to a minimum. These organs and parts become congested, inflamed, and their blood-current clogged and perhaps stopped. Hence arise the various catarrhs and inflammations of the lungs, such as pneumonia, bronchitis, liver congestions, jaundice, kidney affections, and especially the diarrhœa, dysentery, and bowel troubles of summer weather and tropical regions. These ailments are all the usual result of what is popularly and expressively termed "catching a cold," a phrase which has in it a certain amount of truth. And this is the manner, moreover, in which "colds" and their more serious results are caught; no matter whether this is in a frigid or in a warm latitude, a warm or cold season, a warm or cold day, or a warm or cold period of the twenty-four hours: for "colds" may be caught and often run to serious consequences in all regions, seasons, and parts of the twenty-four hours.

Change of latitude carries us into and involves different conditions, both terrestrial and physiological, which are either healthy or the reverse, according to circumstances. The great physiological changes in the body itself have been mentioned already. Then there are vastly different aerial, terrestrial and aqueous conditions; as well as widely changed meteorological, botanical, and zoological states, all of which influence the human body more or less, and often largely. If, under climatic changes we guide our bodies hygienically in a discreet and judicious manner; and accommodate our bodies to changed climate and other conditions by precautions in dieting, clothing,

&c., then we are most likely to retain health. But if, on the other hand, we are careless or ignorant on such matters and neglect such indications, then we are very likely to succumb to one or other of the new morbific influences which surround us.

So also change of season brings with it and includes different bodily conditions, and changing atmospheric zoological, botanical, terrestrial, and aqueous conditions. If we meet these in a judicious manner and conduct ourselves in a wise physiological, that is hygienic fashion, by judicious clothing, dieting, exercise, &c., then we are most likely to keep well and escape the many lurking dangers, climatic, meteorological, and otherwise, which surround us. So, too, is it, but in a less degree, of meteorological changes in the body and in the atmosphere which accompany and arise from change from night to day, and the reverse; and the smaller yet often considerable ones which occur during both periods. These it is hygienically just as necessary to meet judiciously if we would maintain our health; by proper change of clothing and other precautions, as with season and climate.

These considerations and explanations, physical and physiological, are entered into here for the purpose of shewing the necessity for our neither ignoring nor slighting these meteorological changes of temperature, in order to endeavour to avoid many serious and it might perchance be fatal diseases. At the same time they are meant to indicate how to effect this sanitary purpose by constant, careful, and judicious hygienic attention to the skin, to keep it always at the healthy thermometric standard, in other words, at a comfortable normal temperature, with neither a sensation of too great warmth, nor a feeling of chilliness. To accomplish this in the weather of all climates, when the earth's surface and the superincumbent air are warm, the *clothing* of mid-day should be lighter than during the colder morning and evening. And for all three periods, morning, mid-day, and evening, the clothing should be lighter than during the still lower temperature of night, especially about 3 a.m., when the earth's surface and air are coolest of all. So also the clothing for different days should be varied according to the temperature, and more of it or of a thicker kind worn on chilly days or parts than in warmer ones or places. So also in all localities summer clothing is necessarily lighter than that required in spring or autumn: and clothing for the still colder winter should be of warmer material than for the milder seasons, especially summer. So also, while journeying, care should be taken to vary the clothing as we go through warm valleys, ascend cold hill sides, slopes or mountainous regions; and also as we meet with cool sea breezes on one hand or warmer land winds on the other; and so on. On going from temperate to

tropical climates thinner clothing is required; and in making the opposite journey thicker and warmer material for their sub-Arctic or Arctic climates. All this involves constant change of clothing that to many may appear unnecessary and perhaps trivial. Still it is essential sanitarily. And it is by inattention to these items and consequent lack of constant change and of ordinary common sense precautions regarding change of clothing in accordance with the aerial temperature as indicated best by the sense of skin comfort; so as to keep the latter at a proper standard of heat that many a chilled surface has resulted, thereby many a serious disease incurred, and many a valuable and precious life lost.

On the preceding practical remarks certain very useful and indeed indispensable sanitary precautions may be founded; thus:—

1st. As to the necessity for regulating the food and drink as well as the clothing, &c., in accordance with atmospheric temperature, as spoken of in Chapters 2, 3, and 11.

2nd. As to the necessity for changing the clothing in accordance with the degree of atmospheric heat, as spoken of in Chapter 8.

3rd. Exercise, as shewn in Chapter 5, Part 2, is another powerful means of keeping the body caloric up to the normal standard in cold regions; because it promotes and accelerates the blood flow, increases the heart's action, quickens respiration, oxygen absorption, and calorifying processes in the lungs and blood. In warm regions the necessity for keeping quiet, and for avoiding unnecessary exercise, with a view to remain cool, is especially apparent when exercise is taken or work is done; Nature then throws out a certain amount of perspiration, the evaporation of which cools the surface and also gives a suggestive sanitary hint both to avoid checking the perspiration and preventing its evaporation from the surface.

4th. As to the necessity for making artificial heat to raise the body temperature in very cold atmospheres. And, on the other hand, making artificial cold, shelter, &c., to cool, as shewn in a former part of the present chapter.

In Arctic regions the natives make huts of snow, which preserve their body heat, and prevent it from radiating into space. The inhabitants of temperate climates build their houses of stone, brick, &c., for the same purpose. In warmer regions a thinner, cooler material, such as wood, is better. In the tropics tents and openly built houses are the most comfortable, especi-

ally if placed on spots that are sheltered and cooled by trees and hills. Artificial heat, produced by keeping the house well shut up by means of well-closed doors and windows, aided by fires, furnaces, steam pipes, hot air tubes, gas, &c., is often equally necessary in cold climates, to assist Nature in keeping the body temperature up to the normal standard. The best temperature for a room for the inhabitants of the middle or temperate zone is about 65° or 68° F. When habitually kept above this the aerial temperature not only enervates the individual, but makes the change from this to the external air all the more trying. Thus, if a room or interior of a house is kept at a temperature of 85° F. or 90° F., as often happens during the cold winter months of temperate climates, the sudden transition from that to the intense outside cold, perhaps some degrees below zero then, by merely going into the street, is very apt, unless the greatest precautions are taken with regard to clothing, to cause a chill, and thereby perhaps originate a dangerous pneumonia or other grave internal inflammation. This is a very frequent and perhaps one of the most common of all the causes of disease and death among humanity.

Again, in regions with a moderate temperature the necessity for a fire is only occasional, and may be required evenings or mornings, or on unusually chilly days. In warm climes the opposite conditions prevail, and there is often a necessity for cooling the sultry air by keeping windows and doors open, and producing artificial cold by ice or water evaporation, currents of cool air by fans, punkahs, and other mechanical appliances familiar to the inhabitants of tropical regions. These help materially to keep the local room or house atmosphere down to a more bearable and healthier standard.

Although the residents in Arctic temperatures, and those of torrid zones are subjected to very different degrees of heat and cold; long habit and acclimatization have accustomed them to these extremes. So that as a rule not only would they prefer no other climate, but these are the temperatures in which they are healthiest, longest lived, and most comfortable. So, in all countries, hot and cold alike, the extremes of heat and cold felt by the thermometric changes of night and day, summer and winter, or the reverse, are felt as much by the inhabitants of one zone as another, the terms heat and cold being largely relative. The negro feels the cold of his tropical winter though the temperature may be 80° F., or even more, as severely as the Laplander that of his colder northern home. So on the other hand the latter feels the heat of his Lapland summer, such as it is, as much as the former does the fiercer temperature of his equatorial abode. It is considerably different, however, with travellers who flit rapidly from country to country, zone to zone,

temperature to temperature, either for pleasure, business, or science. These often suddenly encounter great and rapid transitions of temperature, from hot to cold and cold to hot, not so much from diurnal or seasonal as from climatic, zonal, or geographic ones. Thus, for example, in travelling from New York or London to Japan or California by sea it is necessary to pass first from the north temperate to the torrid clime of the equator; thence to the cold temperate or sub-Arctic region off Cape Horn or the Cape of Good Hope; thence again into the tropics; and onwards into the colder temperate climate of their final destination. These sudden and great changes of temperature induce greater physiological changes in the body; and are far more trying to it, and more apt to interfere with comfort and health, especially if proper hygienic care is not taken to counteract the danger. And in modern times rapid transitions by steamer, ship, or rail only increase the danger by increasing the rapidity of the thermometric transitions, and thereby the results of these.

The majority of these sanitary suggestions, founded on the physiological explanations here given, are indeed only what common-sense and custom have long followed. Still it cannot be denied that they are often neglected; and hence the endorsement of daily routine by science may and ought to enforce their more implicit obedience: and thereby save much sickness and many lives. The most eminent medical authorities now agree that a man may, by living and acting in strict accordance with hygienic principles, enjoy good health in almost any region, hot or cold. And that much of the impaired health and disease so common in what we term *foreign* countries has been wrongly imputed to their climate, instead of individual carelessness.

Biblical Allusions to Weather, Season, and Climate, Hygienic and Otherwise

These important hygienic factors, season, weather, meteorological changes, and phenomena; so important not only as very frequent sources of disease, but also of infinite value in preventing and curing it, are frequently and pertinently alluded to, directly and indirectly, both in the Old and New Testaments: and also their effects on man, animals, and plant life. The Mosaic code, however, so full of sanitary hints on other matters: says nothing special about these; gives no pointed hints, and lays down no fixed and obligatory laws on these all-important subjects. Although not specially and directly used therein to teach climatology, meteorology, or the hygienics of these; as is the case with food, drink, cleanliness, rest, clothing,

&c., because these are matters in which mankind are more likely to err in ignorance, as they minister so much more immediately to our gratification; they are less frequently, although often far more serious, morbific agents; and they are not so easy to curtly and popularly explain in the usually terse pointed language of Scripture, and so have been intentionally omitted.

The three different regions occupied by the Hebrews in Bible times gave them wholly sub-tropical climates: first that of Goshen, warm and moist; then that of the Desert, warm and dry; then that of the long strip of land which formed Judea and gave them a somewhat colder climate as a whole, but which, owing to its geographical position and its physical configuration gave them a great variety of climates, according to the part occupied. Along the Mediterranean it was littoral and moist; further inland colder and dryer; along their lakes it was lacustrine; while the plains, mountains, and valleys gave them many other kinds of climate. These, however, it is not our intention to describe or to discuss sanitarily at any length; as our province lies more as to what the Bible says about the hygienic influence, and especially as to the more frequently mentioned meteorological changes. As travel in Bible times was unfrequent, limited and slow; the Jews of that day were seldom subjected to climatic changes of temperature resulting from migrations from their sub-tropical region, either to colder northern or to warmer southern latitudes. The race was not scattered as now, but concentrated. Nor were the majority exposed to any other than mere transitions incidental to summer and winter, day and night, and such slight ones as are usual on changing from mountain sides to valleys, inland plains to the sea shore, and so forth.

The Bible shews they sometimes had *hoar frost* (Ex. xvi. 14; Ps. cxlvii. 16); also *snow* (2 Sam. xxiii. 20; 1 Chron. xi. 22; Job vi. 16). Fresh snow usually falls in Lebanon and Hermon in November and disappears early in April in the ravines; but the mountain tops are sometimes covered till late in May. The Bible has only two special notices of falling snow (2 Sam. xxiii. 20; 1 Chron. xiii. 22). It was an ordinary occurrence in winter (Ps. cxlvii. 16; cxlviii. 8). At Jerusalem snow often falls to a foot or more in depth, but seldom lies. At Nazareth it is more frequent and deep. At Damascus nearly a foot may fall and lie a few days. When it falls at Aleppo it seldom lies for more than one day. Anti-Libanus or Ante-Lebanon, a mountain 11,000 feet high, is almost perpetually snow-clad. The snow is carried from thence to neighbouring towns to cool liquors; a practice which still prevails (Prov. xxv. 13; Jer. xviii. 14). In the Holy Scriptures snow is a synonym for cold weather or winter (Prov. xxxi. 21). Its beneficial effect on the soil is alluded to (Is. lv. 10). Also the cleansing effects of snow

water (Job ix. 30). As also its rapid melting by the sun (Job xxiv. 19); and the consequent flooding of the brooks (Job vi. 16). The Bible uses snow as an emblem of brilliancy (Dan. vii. 9; Rev. i. 14); and also of purity (Is. i. 18). They also had hail in Judea (Is. xxviii. 2). And *ice* (Job vi. 16; ix. 30; xxxviii. 30); which was used for cooling beverages, and brought probably from the summit of Hermon and the ravines of Lebanon (Prov. xxv. 13).

Dew in Palestine in summer was so plentiful as to partly supply the absence of rain, and was therefore important. It is coupled in the Divine blessing with rain and mentioned as a precious source of fertility (Gen. xxvii. 28; Deut. xxxiii. 13).

The winds of Judea were the *north* wind, which was the coldest (Eccles xliii. 20). The north wind blowing from June to the equinox was favourable to vegetation (Cant. iv. 16). The *north-west* wind of the autumnal equinox to the beginning of November brought rain (Prov. xxv. 23). The *east* wind, or wind of the Wilderness, blowing from February to June, crosses the sandy wastes of Arabia Deserta (Job i. 19; Jer. xiii. 24). This was violent, very dry, and penetrating, and had the parched effects of the sirocco on vegetation (Ezek. xvii. 10). The *south wind* or simoom of April and May blows from the S.E. or S.S.E., and is very hot; but unfrequent (Ps. lxxviii. 26). Their *west* and *south-west* winds blow from November to February; and are moist, coming as they do from the Mediterranean; and are called by the Arabs the "fathers of rain" (1 Kings xviii. 44; Luke xii. 54). Besides these Judea has its local *squalls* (Mark iv. 37), very severe on the Lake of Galilee. It has also its *whirlwinds*, "Out of His chambers in the south cometh the whirlwind" (Job xxxvii. 9). The Levant has its gales or euroclydon, such as St. Paul encountered (Acts xxvii. 14).

From these Judaic winds those of the *Sinaitic Desert*, which lay on its south and south-west, were not very dissimilar. There the north and north-west winds are the coldest; and might bring rain. North-west winds prevail from the autumnal equinox to the beginning of November. Northerly winds from June to the equinox. The easterly winds of the Sinaitic Peninsula cross the sandy wastes of Arabia Deserta, and are thus the "winds of the Wilderness" (Job i. 19; Jer. xiii. 24). These blow from February to June, and are very dry, violent, and penetrating; parching, injuring, and even destroying vegetation like a sirocco (Ez. xvii. 10; xix. 12; Hos. xiii. 15; Jonah iv. 8). South winds are rarer but very hot (Job xxxvii. 17; Luke xiii. 55). Again, the west and south-west winds come laden with moisture from the Mediterranean; and are the "fathers of the rain" of the Arabs. They blow from November to February. These different winds that aid us in determining the climate of the

"Wilderness," to which the earlier Hebrews were subjected, and that of Judea, where their successors were more permanently located; are also often metaphorically alluded to in the Holy Scriptures. Thus the east wind, as symbolic of unprofitableness (Job. xv. 2); lack of stability in war (Jer. xviii. 17); the effects of Divine vengeance (Is. xxvii. 8). Again, wind generally is used as an image of speed (Ps. civ. 4); of transitoriness (Job. vii. 7); of the Creator's power (Job xxviii. 25); of the searching operations of the Holy Spirit (John iii. 8).

The *temperature* of the climate of Palestine shews a great range of temperature in a comparatively narrow compass, as the country is not over 140 miles long and 25 to 90 miles broad; and indeed partakes of nearly all supportable climates as we approach the sea coast of the mediterranean; or enter the long deep valley of the Jordan; or reach the broad flat plain of Esdraelon; the table lands of Judah and Ephraim; or the higher elevations on the slopes of Carmel, Tabor, and Hermon. The extreme yearly range of temperature is 52° F. The isothermal line of mean annual temperature, viz., $65\frac{6}{10}$°F. of Jerusalem, passes through Gibraltar, Madeira, Bermuda, Florida (north of Mobile), and California. In Palestine there are two seasons, as in tropical and sub-tropical countries generally; or, as they are described in the Bible, winter and summer, cold and heat, seed time and harvest. In the Judaic valleys they had considerable heat. Whereas their high open plains and mountain heights, such as those of Syria, often brought bitter cold by night, and intense heat by day (Jer. xxxvi. 31). The cold of winter and heat of summer were both considerable (Jer. viii. 22).

As a whole the climate of Judea is doubtless very much now as it was in Bible times; as is no doubt the case with that of the Wilderness of the "Wanderings." Thomson tells us that the former is extremely variable and uncertain. There seems no fixed time for the commencement of the winter rains, nor when they will cease. These variations subject farmers to much uncertainty and many losses: all kinds of crops fail as frequently in Syria and Palestine as in America. This has always been the case, and is the reason of the Bible-recorded famines. And the fact gives significance to the language of the Holy Scriptures, in which regularity in the rains and certainty in the crops were guaranteed to Israel on condition of faithful obedience instead of the usual uncertainty. Even now the natives ascribe regular and abundant rains, fruitful seasons, and good harvests to the direct agency and interposition of God.

The climate of Judea, so trying and treacherous to vegetation, must have been equally so to the health of the Hebrews and its other inhabitants. To compensate for this, however, it was

magnificently fertile; they acquired it easily and for nothing. And, fortunately, never perhaps has there been or will there ever again be a nation better fitted by their original hereditary health; the care taken of them in the Wilderness, by sanitation and otherwise; and their perfect health, both of men and women (Deut. vii. 14), in which their cattle was included; to enable them to cope with climatic and meteorological changes, which after all were not very serious and not so severe as those which feebler races have often to contend against elsewhere, and in many other parts of the globe.

As might be expected we do not find the Scriptures speak either specially or inferentially regarding means for obviating the discomfort or danger of the frequently great climatic changes of temperature, &c., already spoken of. But it does speak of the discomforts and dangers of the material alternations of night and day and summer and winter. Thus it alludes to the heat and drought of the day and frost of the night (Gen. xxxi. 40; Jer.xxxvi. 3); and also those of winter and summer (Ps. cxlvii. 17). Allusion is also made to the oppressiveness of noontide with its overpowering sun, and summer heat (Gen. xviii. 1; Mat. xx. 12); also of its discomfort (Ps. xxxii. 4); also of its domestic disadvantages (Ex. xvi. 21); and likewise of its dangers to life and health (Is. xlix. 10; Gen. xxxi. 40; Jas. i. 11). Also of the discomforts of cold and frost (Prov. xx. 4); and its dangers (Is. xxxi. 40; Ps. cxlvii. 17). From these we may often glean direct or inferential sanitary hints of practical value. The simple means employed to keep the body warm in times of cold; and those for cooling it in warm ones are alluded to. Obviously these means in both cases favour comfort and health, and are thus of sanitary import. During cold it speaks of and thus suggests additional clothing (Job xxiv. 7-10; Prov. xxv. 20; xxxi. 21; 2 Cor. xi. 27). Also of the benefits of companionship (Eccles. iv. 12); of the heating powers of food and drink (Is. v. 11); of the warming benefits of fires (Is. xlvii. 11; John xviii. 18; Acts xxviii. 21); of the shelter and preserved heat like that of a hedge (Nah. iii. 17); or of dwellings (Acts xxviii. 2); or winter houses (Jer. xxxvi. 22; Amos iii. 15).

So also, for the purpose of lessening the intense or oppressive heat of the weather, it alludes to the shelter of a cloud (Is. iv. 6; xxv. 4-5); or that of a rock (Is. xxxii. 2); or of summer houses (Amos. iii. 15); or a summer parlor (Judges iii. 20); of currents of cool air (Gen. xviii. 1); of cooling drinks of snow (Prov. xxv. 35; xxv. 13). These were simple common-sense devices for keeping the body as nearly as possible at its normal temperature, thus preserving both comfort and health. It is interesting to observe that these are identical with those used at the present day for similar purposes, hygienic and otherwise.

Interesting as are the meteorology of Judea and Arabia, and its hygienic bearings on the welfare, health, and life and happiness of the Hebrews of old; the vastly increased importance of the subject of the modern sanitary aspects of local weather, climate, and season, over that of Mosaic times, and even over that up to the era of the New Testament must be fully recognised by thinking minds. As the human race has spread over nearly every quarter of the globe, and therefore lives under every variety of clime, and under temperatures to which the Hebrews of Bible times were strangers, inasmuch as these include arctic, cold, and tropical heat, thereby materially enlarging the subject of heat and cold, viewed physiologically and hygienically, and making the theme of climate, season, and weather, one of far greater moment and of vaster sanitary import than it was to the ancient inhabitants of Palestine. This fact holds good not only as regards the dominant and widespread Anglo-Saxon race; that people who travel most and thus encounter the widest extremes of temperature, the main factor in all climates, seasons, and weathers: but also as regards the former Wanderers in the Wilderness and subsequent conquerors and occupiers of Canaan, the Hebrews, now found scattered, yet unbroken in lineage, in every region of the globe and in every clime.

While the value and sanitary suggestiveness of the Scriptural remarks on weather, meteorology, and their various factors, must be conceded: in no part of the Bible, not even in the concentrated and pointed and educational Mosaic code do we find definite hints, rules, or laws of conduct laid down for man to follow, so as thereby to meet the morbific accidents resulting from meteorological, seasonal, or climatic changes; especially those which flow from that factor which most frequently initiates these, namely, sudden and great and unexpected changes of atmospheric temperature: or laws similar to those which have been laid down and made imperative regarding food, drink, rest, &c., &c. This is doubtless because on this point the unitiated public would find such laws far more difficult to understand than in the case of dieting, &c., involving as they do abstruse physiological knowledge not then understood, even by medical men. And again in the hygienic matters of diet, drink, rest, exercise, &c., and others in which the gratification of the senses are indulged in, we are all much more likely to err and persist in our unwisdom, regardless of future evil consequences; whereas aberrations in the hygiene of climate and weather cause much and speedy discomfort, which warns and incites us to counteract them by clothing, shelter, food, &c., and other items, patent even to savages.

Although various meteorological factors and phenomena, such as rain, snow, hail, frost, cold, heat, &c., are often and most appositely used typically in the sacred text, no unbiassed mind

can doubt that besides being incidental to the Bible narrative, they often, if not always, have a secondary and subordinate, yet important, intentional, and educational hygienic application and meaning: which combines with much other Biblical sanitary matter to form the complete hygienic or health code of the Holy Scriptures.

It will thus be evident that weather, season and climate combine to increase the otherwise numerous factors that influence the welfare and health of the human system either for good or ill; and thus to act as hygienic or unhygienic agents as we use them. To the dismay perhaps of some all this may seem an unwelcome revelation of the complexity of sanitation and of the study of the care which the Almighty desires and indeed insists on of our individually taking care of our health and life by constant wise observation and precaution. To many now, as no doubt to the ancients of earlier Bible times, it would seem fortunate if the human body in this matter had been made as the respiratory function is, largely automatic, self-regulating and able to look after its own salubrity and welfare in every variety of climate, season, and weather change without troubling us in the matter. But our Maker and Sustainer has ordained otherwise. We must perforce accept our earthly environment as we receive the body itself, as our Creator designed them; and our atmosphere, its dangers or benefits as we find them. And our plain duty in the matter is, to hygienically tend our frame, its health and life and comfort, all of them God's special gifts bestowed for our happiness and mission, as carefully as we do all of our many other sanitary indications and duties, on judicious, especially Biblical lines.

CHAPTER XII

MENTAL HYGIENE

"The spirit of a sound mind" (2 Tim. i. 7; Mark xv. 15; Rom. viii. 6; 2 Pet. iii. 1).

We now leave the consideration of the health and the sanitary environment, either best suited for, or apt to militate against, the salubrity of the grosser and more animal part of our frame and its varied functions; for the study of the hygiene of the most pronounced, important, and indeed dominant, of all the bodily systems already enumerated, that system which rules, inhibits, and correlates all of the other systems, namely, the cerebro-spinal nervous system; particularly its central part, the cerebrum or brain; and the three chief functions of this, the mental, moral, and spiritual.

It will be well, however, before proceeding, and with a view to facilitate enquiry, to mention the chief components of the dominant nervous system and their principal functions. These are:—

A. The brain, an organ comparable to the central telegraph office. Its functions are:—

1. Physiological, namely:—
   - *a* To receive, record, and judge afferent or incoming impressions, carried thither from the rest of the body by the general nerves, or by those of special sense, namely, seeing, hearing, tasting, smelling, and touching.
   - *b* To originate and return reply-messages and orders to the various organs and parts which the nervous system controls.
2. Mental. The cerebrum or brain is the organ by which the mind works, originates, and controls thought, memory, &c., &c.
3. Spiritual. It is also possibly, nay probably, the chief seat of the real ego and at least the organ by which the soul acts, holds intercourse with, and controls the rest of the body; keeps in touch with the world, external things, higher supernal matters, and God.

B. Ordinary nerves; consisting of the universally distributed
   - *a* Sensory or afferent, for conveying sensations, of

pain, pleasure, heat, cold, itching, and similar sensations from all parts of the body to the recording brain.

b Motor or efferent nerves for conveying notices of activity from the central organ of will power to the muscles of the body to produce motion.

C. Special sensory nerves, adapted for conveying impressions from and returning messages between the brain and the special organs and functions; the optic nerves for seeing, auditory for hearing, olfactory for smelling, gustatory for tasting, and tactile for touch. These nerves and organs enable us and our central thinking and acting organs and agencies, the soul and brain, to hold intercourse with the world and the rest of the wide creation.

The importance of our Biblico-hygienic studies thus rises as we proceed in our investigation. The study of our grosser functions and our purely body hygiene and health and their environments of food, drink, exercise, rest, &c., though of vast import to the frame, and therefore indirectly to our higher nature, is clearly of less importance than is the study of the latter, namely, mental, moral, and spiritual health and hygiene, with their eternal interests. Moreover, the study of the latter three rises individually in progressive proportion and value. Thus while mental is of more import than physical health and hygiene, so in turn mental health and hygiene are surpassed in importance by moral and spiritual. Again, just as the different factors of corporeal health and hygiene were found to be closely correlated; so likewise are those which represent our higher nature. So also the brain factors are closely associated with the body factors. In fact all the factors of human health and hygiene and their environments, physical, mental, and psychical, are closely associated, intertwined, and mutually act and re-act on one another for good or for evil, according to their healthy or morbid character. A healthy physico-hygienic environment is the most likely to aid other factors of life to induce a healthy mental frame of mind: and that again to favour a healthy, moral and spiritual condition. The reverse holds equally good; of unhealthy physical surroundings inducing an unsatisfactory mental, and that again an equally unsatisfactory moral and spiritual state.

Before entering more deeply into the consideration of this somewhat abstruse subject, it is perhaps judicious to premise certain definitions of what is meant by the different functions of the human brain; and what by mental, moral, and spiritual hygiene, their objects and environments; matters with regard to which there may be misconceptions.

1. *Brain* is the seat and organ of the intellectual faculties.
2. *Mind* is the thinking function, principle, or understanding; and the physiological result of the action of brain tissue. The study of the factors which affect its health and strength and longevity, and those which oppose these is termed *mental hygiene.*
3. *Thought* is the result of this action; mentation, or mind conception.
4. *Intellect* and its degrees, talent and genius; are faculties which the mind possesses for exercising its thinking powers.
5. *Morality.* By this we mean those feelings and impulses of right or wrong doing that animate us towards our fellow creatures; and the nature and depth of which are known by the terms high or low, good or bad, pure or impure, &c. These feelings spring from what is termed both popularly and Biblically, the "heart." Though reflected towards and felt in the heart, which is the most impressionable of all our organs, their origin is no doubt mainly the brain. The study of the factors and environment; and of what promotes their good health and what opposes their bad aims or morbid tendencies, and what mars these is called *moral hygiene.*
6. *Spirituality* or *Religion* implies the exercise of those implanted and congenital feelings of dependence, awe, and veneration, which cause all humanity, savage and civilized alike, instinctively, especially in want or danger, to recognise, own allegiance to, worship and supplicate a higher power than themselves, whom they recognise as their maker and the author, sustainer, owner, ruler, and Lord of all things. Their seat is the soul, by which entity and the mind they are engendered, fed and controlled. Their chief function is to beget, feed, and control the impulses of the "higher" and "inner" life which all individually live, and into the privacy and many of the secrets of which none can enter, save God only (Is. xxix. 15).
7. The Soul, the real ego or individual, is an immortal spiritual entity of Divine origin, which has the body as a temporary earthly dwelling; and probably locates chiefly in its chief organ the brain. Its aspirations are or ought to be towards the Heaven and God from whence it came; and whither it may, if properly guided, go back. This guidance and the study of the factors which help and those which hinder its health is named *spiritual* or soul hygiene. The soul is the

source and origin of the moral and spiritual feelings which ennoble right-thinking human beings; and please their Maker most (Phil. iv. 18); and also of those sin-begotten evil faculties which disgrace the race and are so abhorrent and alien to the Deity (Job viii. 20).

One and all of the organs, functions, and faculties are, like the organs and parts which produce or locate them, though distinct and independent, yet mutually helpful and closely correlated. Whatever affects one for good re-acts similarly on the others; and vice-versa, whatever affects one of them for evil is likewise apt to do more or less harm to the others. So, too, as regards their hygiene. The sanitary environment of the brain and mental faculties, when salutary, acts beneficially on the heart and moral feelings, as well as on the soul and its spiritual well-being. And vice-versa, evil tendencies or aberrations in one department affects all three morbifically more or less, in accord with the inexorable laws of Nature and God. Hence the importance of carefully guiding and guarding the mental, moral, and spiritual hygiene so intimately and indissolubly allied. The results of inattention thereto are profound and grievous, and imperil the health, happiness, and even existence of mind, heart, and soul alike. These conclusions are all warranted by the text of Holy Scripture.

Indeed, the Bible throughout is a huge hand-book of the wisest, deepest, purest, most beneficent, and invaluable, mental, moral, and spiritual philosophy: most concentrated in two places, namely, in the New Testament, in what Christ gives or inspires; and in the Pentateuch, especially the Sinaitic law enunciated by God: the Old and New Testamentary revelations of Divinity. And all through, both the Apostles and the Gentiles of the one period; and the ancient Hebrews of the other, and through them all mankind are taught two inestimable lessons, viz., 1st, that it is equally Man's duty and his interest to cultivate just thoughts of right and wrong, good and evil; and oppose and crush the opposite proclivities. And, 2nd, that to *know* what is best is not all that is required, but that it is necessary and wisest to *do* what is right; and most satisfactory both for time and for eternity. Jehovah desires neither lip nor knee service, but heart sacrifice. And instructs us accordingly by giving us innumerable Bible maxims and laws for mind, heart, and soul guidance; the best the world can ever see, inasmuch as they emanate from Him whose wisdom is supreme and perfect, whose counsel is mighty, foresight omniscient, and thoughts both very broad and deep (Ps. cxix. 96; Prov. xx. 5).

Important as it unquestionably is for all mankind that general philosophy and science should be brought down from the higher regions of thought to the level of less gifted minds, and made as plain to the masses as it is to the learned: it is clearly of still vaster import that Bible sanitary science of this nature and of the higher or soul life should be made clear to all men; not only because it is that alone which is strictly reliable and true, least likely to be found erroneous, except perchance from human errors in translation and transcription: but also and chiefly because it is invaluable knowledge which can be obtained in no other book and nowhere else.

Mentation or thought may be of three different kinds, intellectual, moral, and spiritual; and that mental, moral, and spiritual hygiene and health are most intimately intertwined, correlated, and interdependent in every human being, educated and uneducated, is well known, especially to doctors and Divines. The three, however, are best studied separately, for our present purpose.

1. Mental or Intellectual Hygiene

That mind or intellect and the result of their action, thought, are all complicated matters, and not the sole effect of one process or factor, but of many, will be at once rendered apparent by remembering how many different and distinct functions are involved in their production and required to work harmoniously to effect so infinite a variety of results. Ordinary thought requires the operation, application, correlation, and agreement, more or less deep and continued, of the following gifts, qualities, and acquirements characteristic of a well-regulated mind. 1, habits of attention; 2, association of ideas; 3, conception; 4, reflection; 5, regulation of thought; 6, activity of mind; 7, proper selection of objects; 8, abstraction; 9, memory; 10, government of the imagination; 11, culture and regulation of reason or judgment; 12, investigation; 13, fact-collecting; 14, tracing cause and effect; 15, deduction and analysis; 16, right condition of the moral and spiritual feelings, &c.

This list will suffice to shew how complex a matter mentation is; and will possibly suggest the idea that the thinking organ or brain is equally complex. In fact, neither the general nor microscopic anatomy of that organ are yet fully deciphered; nor are its physiology, pathology, and all connected with the structure or functions of that abstruse part of man, and its chief manifestation, mind. But so far it is pretty certain that though the cerebrum is apparently a single organ it is really an aggregation of sub-organs; each of which has no doubt its own

special though perhaps transferable function to perform in the many complicated operations of what is termed mind. The cells of the outer cortical or grey matter rather than its inner white fibrous texture, is doubtless the thinking part; the inner or white fibrous portion being mainly concerned in conveying messages to and therefrom by the sensory and the ordinary nerves so widely and minutely distributed over the body. Whether or not each of these brain functions is performed by distinct portions of cerebral tissue, of if the grey matter generally can accomplish the whole, is like many other problems in mental and cerebral anatomy, histology, and disease, still involved in uncertainty, because for obvious reasons the subject is so obscure and involved.

But the thoughts which the brain produces are of two kinds; intellectual and moral. For the present we are to consider the former; the latter will be spoken of subsequently. The study of mind and mentation is abstruse and too lengthy to be taken up here as a special theme. And it will be sufficient to point out how much is implied and how many different mental operations are effected by the human mind; with a view to shew how important they are, and how necessary it is to keep the brain and its functions in proper condition; and how needful it is to attend to the mental environment and its hygiene to effect this: especially when we remember how important a factor healthy mentation is in the life, inner and outer, of every individual; and how very sensitive, physically, physiologically, and otherwise, the brain, the organ of mind, is.

To enable the brain to work properly and healthily so as to evolve those many varied and important functions, and make it cerebrate harmoniously, it is clearly necessary that the brain tissue should be sound; and to effect this that both it and the body, of which it forms one of the most important parts, should be of healthy origin, vigorous, wisely educated, and have a favourable environment and salubrious conditions of life, physical, physiological, mental, moral, and spiritual. What these conditions are, what circumstances aid and what opposes them form the study called intellectual or mental hygiene. The vast importance of this, both *per se* and as a supplement to the study of body sanitation, and also to the higher one of soul hygiene, will be apparent when we consider the many evil results to body, brain, mind, and soul, effects that may materially influence our here and our hereafter, that may follow morbid mentation and its usual sequel, morbid action; and the opposite or beneficent consequences that may accrue from its healthy development.

Our mental, like our corporeal life, and all else in the human frame, is never at a standstill, but is continually undergoing

intellectual evolution, and thus either advancing or retrograding, improving or deteriorating. The most approved modern hygiene informs us that the thinking, mentation, or cerebration, which is wise, right, just, and to use a synonymous term, healthy, is for many valid and most important reasons best, and therefore that which ought to be strenuously aimed at and cultivated by all people: the opposite being of course as sedulously shunned. Because it is the former alone that can benefit us; and not only aid and improve our lower temporal or body nature, but also our higher nature, soul, and eternal interests; and that may and will beneficially re-act on our home, friends, community, and country. It is that kind alone that will bring "peace at the end" (2 Pet. iii. 14), when these three dread ordeals come in view; namely, *death*, the end of our earthly career and of all our cogitation so often vain (Tit. iii. 9) and worthless, and the outcome of our education upward or of our career downward: the *future*, so mysterious, uncertain, and unavoidable: and the *judgment* or day of reckoning, when every thought of ours, good, bad, and indifferent, shall be weighed in the impartial scales of supernal justice, and the very inmost heart communings and incipient ideas brought to view in the fierce light of eternity, and the all-seeing eye of Jehovah.

What therefore are we to deem right or healthy thought is a pertinent and almost unavoidable question. It may be applied and applied alone to that which is alone worthy of a true human being and people true to themselves, their fellow creatures, and their God; men and women who realize they are "living souls" and not mere animals; beings with a future as well as a present, and gifted with these high endowments for the proper exercise and care of which they have yet to account; beings born in enlightened times and regions; Christians and not heathen. Right thought is that of which the thinker has no reason to be ashamed or afraid of before his fellow men or his God. It includes all the ideas which are honest, upright, gentle, ennobling, elevating, and pure: such as will neither debase his or her moral principle or soil the soul; seeing that this world, and our mortal body and accessory, brain, and its physiological outcome, thought; and human life as a whole are one and all merely the basis of and preparatory to others more highly evolutionized or developed, in a future higher and purer plane and environment. Moreover, right thinking should be a prelude and chief motive for right speaking and right doing: in short, for a healthy walk and conversation (Ps. 50. 23), such as becomes a man true and just to himself, his fellow creatures, and his Maker. Without this practical outcome right thinking, of however high an order, is individually worthless as

an exponent of character and worth, while unexemplary and misleading to others.

Certain facts in conclusions will commend themselves not only to thoughtful medical men and Divines, but to intelligent laymen. And first, that for the production of healthy thought, we must have a healthy brain or thought generator. The mentation of a weak, sickly, or diseased organ is apt to be erroneous, distorted, and faulty. It is therefore clearly necessary to keep the thinking organ sound and strong if we would have good thought. To effect this it must have proper surroundings and a judicious environment. The study of the factors and forces that combine to form or influence these; and that thus help or hinder healthy cerebration, forms the science of mental hygiene. This includes and necessitates certain factors to be presently spoken of.

The vast importance of attention to these will be still more forcibly shewn by remembering that our mental is a most important part of our general existence. It is even more necessary for and conducive to our welfare that this should be healthy than that our physical life should be good: inasmuch as the body is merely given as an organ for the evolution of mind by means of a special organ, the brain; and the mind, brain, and body as servants of the soul. The importance of the subject will be still further illustrated by remembering that to promote the welfare of this supernal visitant, passing traveller, and transient occupant of earth, and its temporary home, the body, Jehovah has taken the trouble to bequeath a wise handbook of hygienic mental instruction, elevated in tone, and unsurpassed in literary style and attractiveness; so that each individual may personally promote his own highest and best mental interests by its perusal and attention to its invaluable counsel; and has promised not only His "light" (Ps. xxxvi. 9) to guide our mental studies, but also His paternal and all-potent aid to promote them. For, like ourselves, originally "made in God's image," Jehovah naturally favours most and likes best those willing to be instructed and led by Him.

The brain being the recognised organ of the mind; its function being among other things and mainly to produce thought; it is clearly necessary that the all-important physiological thinking organ should, like all other living things, have a proper environment fitted to keep both its special structure and its special function healthy, sound, and strong. A badly nourished, weak, ailing, or poisoned brain can no more be expected to generate healthy thought than a similarly circumstanced eye to see or ear to hear distinctly, stomach to digest, or liver to secrete healthy bile.

The more important of these necessary factors are:—

a That the brain should be well nourished and properly fed; that is that its blood supply should be rich, good, and abundant. No brain, even the best, can long work strongly, think clearly and long, on insufficient food; or on blood made faulty by over-feeding and its results, dyspepsia, gout, &c.; or by food which furnishes diseased blood from erroneous dieting, as in scurvy, purpura, and other ailments.

b The liquid sustenance supplied to the brain should also be judicious. The mentation that results from or during over-indulgence in over-stimulating and narcotic alcoholic liquors, which in moderation may not be intrinsically wrong; is likely to be as faulty as the semi-poisonous fluid which evolves it.

c Pure air and an abundance of oxygen is especially necessary for healthy cerebration. Air re-breathed and laden with noxious gases and vapours, or poisoned by other additions than human ones and defective ventilation, poisons and dulls the brain, which then generates imperfect, weak, or erroneous ideas.

d Education is an important factor in the health, life, and hence in the hygiene of all our bodily organs and functions. For example, in those of the eye, ear, taste, smell, and touch, voluntary motion, and so on. That of the brain should be especially judicious. This should not be forced; but above all it should be wise. The *infant* knows nothing at birth. It acts according to animal instinct. But its education begins at once; and it is a mistake to fancy that the babe is unobservant and slow to perceive or unapt to learn. It is quite the contrary. In certain directions, not as regards the higher mental faculties, but as regards the lower ones, especially the animal instincts, the precocity of the intellect is very strong at birth. How important then that the infant and the child, even before they can speak or reason aright, should have wise instruction to guide and develope this from parents, nurse, or friends; for those who in their immature, yet most receptive judgment, deem everything right and worthy of imitation, that comes from such a source, an environment which, though narrow, is their world. Not even adults are so quick to discover and utilize friendly weaknesses and loving proclivities which yield to its whims and its wants, as are babies at the breast. And it is well to remember with a precautionary view, that not even mature age is so

ready and prone to listen and learn faulty and evil words and acts and even discover the prompting motives, than these latest scholars in Nature's great school, whose moral and spiritual life are still less developed and appear less quickly, but are even more impressionable for good or for evil than their yet immature physical existence. The kind of mental food and instruction we present to the infant is thus far more important than is the physical aliment about which we are generally so careful. The education of youth should be conducted with equal care, so as to evolve and teach healthy mentation; by the good example, conversation, and education of parents and teachers alike; by wisely conducted tuition, the introduction and allurement to study the best books of the most cultivated ancient and modern minds. What is submitted to the brain should be pure, healthy, and worth storing. Chief in this list should be that volume in which proofs of surpassing intellect are most evident, and which forms an ideal for purity, comprehensiveness, truth, accuracy, literary style, and wisdom that will never be surpassed, inasmuch as the mastery of our thoughts and our life after the model of its teachings would be the most glorious of victories over self, and the best philosophy in which youth could be indoctrinated. The Holy Scriptures are full of illustrations of the thoughts of Jehovah and of Jesus and of their most highly honoured followers and servants, often given in their own language. Thoughts that the Supreme would have us to imitate and practice and make their outcome a mental life such as he would fain have all mankind to lead: thoughts such as those with which He favoured Adam and Eve in their first holy estate when He condescended to walk and talk with them in Eden. All this is equally applicable to our maturer years. Our human tuition does not end with school or college. We leave these only to enter the vast seminary of life. The world is only one of God's schools, in which He would fain be our chief instructor. But alas we are unruly, often choose others, and frequently aim at self-tuition. But unbiassed judgment tells us in our calm moments that pure, upright, noble thinking, after the Divine model, as set forth in the Bible, should be our constant aim as best for us. Above all, we should permit our own self-evolved thoughts and individual cogitation to have no other character. Auto-infection and self-

poisoning is as likely to happen with intangible thought as with the tangible morbid body and its tissues. Good, pure, and lofty ideas beget others, as inferior or unworthy ones do such as themselves and are to be shunned. Thought begets thought of its own kind, whether the germ idea is derived from our fellow creatures or from books. And as we desire, and ought in full mental health to desire, to keep our brain and its thoughts healthy, our object should be to select our friends and our literature wisely. The latter should be the productions of the best models of male and female mentation, especially of those who have themselves lived wisely and well, who wrote as they practised, and aimed to attain the great end and object of life as it is viewed by our Maker-instructor, and as fully and clearly set forth for our especial benefit in His human-life hand-book, the Holy Scriptures. The pursuit and imitation of lofty intellectual ideals are no more derogatory or unmanly than it is to strain after the more worldly ones, so dear to many, with political, commercial, literary, and other outcomes. Nor should ideals of this and even of the loftier kinds to which they should lead, be deemed chimerical or utopian and unattainable by human kind; since some of the great facts that the Saviour's life on earth was meant to prove was that it is not so. We cannot reach the heights that he did, but we can try and do our best; and according to this we shall be judged by the Heart-searcher. Human beings are learning from birth until death. So possibly with the soul after that event. It may be learning and becoming more and more erudite in supernal things all through eternity. So if wise for our own best interests, our culture will be ever upward and onward; after the model of the Divine exemplar and pattern man, whose specimens of lofty mentation are the best that can be studied and imitated. And for this the Holy Scriptures are our hand-book. While it is well to bear in mind the oft-quoted saying, we are only beginning to know how to live when about to die. In no department of human life, except our soul's interests, are progress and evolution or development more evident for good or for evil than in intellectual matters. Is it not better that it should be the former? And for this we ourselves are the main agents. And yet not the sole factors. The two great forces now spoken of are ever at work in humankind individually; sin fighting against good;

Satan against God, endeavouring to mar His beneficent mind-healing and mind-strengthening hygienic work. In no department of hygiene is this fact more apparent than regarding human mentation, except in the higher department of this to be spoken of presently, namely, soul life and hygiene. It is for each individual to choose or to reject the better kind. If we choose the former, it will not be without the best of sympathy and the most potent of all aid. Under such an instructor and with such help, our chief thoughts should be such as to aid and promote the interests of our higher nature and spiritual and moral life; for the use and welfare of which the human mind and brain are mainly intended to be the instruments. These studies of the more abstruse hygienics of the brain and the mind are no more out of the domain of the physician than are their diseases. To promote the vital ends here pointed out the most important items are:—

1st. The companionship of wisely chosen friends, whose conversation will enlighten, improve, and elevate us mentally.

2nd. The perusal of carefully selected books, secular and sacred. Of the latter no book yet, and none ever likely to be written, can compare to the Bible for its literary merits and its lofty and ennobling mentation and wisdom, in addition to its many other pre-eminent excellencies.

3rd. The study of Nature, God's unwritten volume and second grand subsidiary revelation to Man, is a most important aid to develop and foster healthy mentation, large and healthy views, not only of Nature as a whole but of human kind and of the Creator. Few studies give the enquirer more unalloyed pleasure or yield more profit. And, like ourselves, Jehovah necessarily interests Himself most in those who admire and study His works as well as His Word, and will assuredly give such enquirers His light and His leading in the pursuit (Ps. xxxvi. 9).

4th. The study of God Himself and His attributes, by reiterated perusal of His hand-book, the Holy Scriptures, is the most important of all teachers of healthy mentation. Inasmuch as this book is an inexhaustible mine of the best, loftiest, most ennobling, and purest thoughts, and their outcome, healthy living; our chief source, surpassing even the book of Nature, in supplying man with the only reliable knowledge we have of

Himself, His works, and many other minor subjects subordinate to these in import, but yet of the highest value to beings who, like mankind, live so much in mystery, and only see as through a dark glass (1 Cor. xiii. 12); and necessarily think with equal uncertainty. A book, certain by its frequent and believing study to increase its Author's interest in us individually, great as that interest always is, even for the erring (Mat. ix. 13).

The amount of mental work that humankind can stand depends largely on the individual and nature of the work. No precise rule or law can therefore be laid down on this point. We may be sure, however, on the one hand, that mental toil is not excessive so long as the appetite continues good and sleep sound. When either or both of these begin to fail, there is danger, and we should ease or intermit the cerebration for a time. Judicious brain work is in itself healthy, physically and mentally, to body and brain; as literary men, such as barristers and clergymen, are as a rule long lived. On the other hand, cerebral overwork or strain may be recognised by certain symptoms, especially mental irritability and exhaustion, sleeplessness, nervous laughter, incapacity for task work, lolling, yawning, languid manner, flagging will, headache, dreaming, one or several of these, which may lead on to somnambulism, colour blindness, or other nervous diseases. These should be regarded as Nature's danger signals, which ought to be at once attended to.

e For healthy, and especially for high class and profound mentation, the body as a whole should be physiologically and physically healthy, especially the thinking organ, the brain itself. Even severe unavoidable mental toil is best borne when the diet, exercise, and general bodily hygiene are all well attended to. Indeed the human brain is capable of an almost fabulous amount of active and even prolonged work, provided simple yet full and judicious attention is paid to its hygiene, to that of the entire body, and the normal conditions of brain and body health; especially to providing a necessary amount of proper food, pure air, periodic rest, and satisfactory recreation, in proportion to the brain work performed. Where disaster has arisen during or has followed excessive intellectual work, this morbid mentation and its consequences have been due not so much to the heaviness or length of the study, as to the indirect influence on the brain function and tissue of one or more and often all of these unhygienic agencies now alluded to on

the body and blood and the re-action on the organ most in evidence. The *hard* student in his eager pursuit of knowledge is only too apt to centre his thoughts too much on his theme and thus forget and neglect his indispensable rest, recreation, diet, ventilation, even his cleanliness and necessary bodily functions, without the healthy co-operation of which the brain cannot continue to bear the overstrain, so thinks erroneously, breaks down, and disaster follows. Hence doubtless why it is largely that the Scriptures have given so much hygienic advice how to keep the body healthy by insisting so strongly and instructing us on the rudiments and main facts of dieting, drinking, rest, exercise, and other sanitary matters of equal import, not only for the body generally and its various organs and their functions, but also and principally for the important brain and its function of cerebration, one of the most important physiological acts in the human frame, and of especial import that its results should be healthy, inasmuch as morbid or erroneous thought may give rise to or indirectly originate much and serious bodily troubles. For just thinking we ought to be not only healthy but disease free. In disease the brain itself and the blood which nourishes it and enables it to generate thought, are apt to be equally morbid; the one unfit to think and the other to help it to cerebrate healthily; brain and blood being alike vitiated by the morbid poison: or the brain unnerved by pain or other alien sensations. Morbid products generated in the blood and tissues, perhaps in those of the brain itself, by morbific conditions, cannot possibly help the brain cells and fibres to cerebrate healthily. Bodily afflictions often depress and influence badly both the mind and the soul: just as mental affections and troubles re-act on the body: so curiously are all our bodily organs and functions interwoven and correlated, even the intangible functions of the mind. These considerations should only incite when fully realized, to closer attention to a careful hygiene both of the body, but especially of the brain itself, so as to avoid disease in either, especially in the latter; and thereby forestal and prevent hasty, unwise, impure, or faulty thoughts that may do the individual endless harm. Here, again, the Holy Scriptures anticipates the idea here enunciated by proferring the very hygienic advice we require on this point: and doubtless with that beneficent prescience which pervades

its every book and page; and given for that very purpose. Jehovah, Man's best preceptor and his Biblical instructor in hygiene, has thus met and anticipated this as He has every one of the numerous wants and deficiencies of humanity, sanitary and otherwise; and instructed them on every subject on which they are popularly ignorant; mental hygiene included.

That mental operations of the brain should influence the physiological functions of the body generally may at first thought seem strange. But the close connection that exists between them both in their healthy and in diseased conditions will be readily understood by remembering that the thought generator and manifester is only an organ and part of the complicated general body system; which itself is a co-partnership of organs. In health the mind as a rule acts on the body, and the body in turn on the mind: and it is in health that the body, the mind, and the soul are alike in the best form and condition for healthy action. Whatever influences or injures either, influences and injures the others. The mind is strongest when the body is most vigorous. A weak frame and constitution greatly diminish both the desire, ability, and pleasures resulting from the exercise of the intellectual faculties. A healthy well-developed brain implies a well ordered mind and strong intellectual powers. And, although instances have occurred to the contrary, prolonged high mental vigour is in most cases incompatible with a weak frame or imperfect health. Size of brain does not so much influence the amount of talent as quality of the tissue and education. After what has already been said, no matter what the age of the student, old or young, education should not be wholly and deeply concentrated on mental training; while the physical condition of the body, and especially its copestone and most delicate organ, the brain, are entirely neglected or made of subordinate importance. In other words, the brain and nervous system should never be educated at the expense of the bodily health; otherwise both may break down. The evil effect of a mistake of this nature has often been practically shewn. Beveridge's statistics for Scotland have proved that twenty years before the operation of the Education Act the deaths among children and youths between five and twenty years of age, as against those from all causes, was 5·8 per cent.; while during the ten years that followed it rose to 7·7 per cent., from excessive and injurious brain work. At all ages intellectual cramming and forcing are injudicious, especially for the young; and very apt to injure young females at certain periods. It is also unwise to exercise the brain by teaching, properly so called, before the age of seven; especially when the child is nervous and delicate; that is during the period of child-mind

and the stage of brain growth. A safe rule in educating the youth of both sexes is to lead out the faculties of individuals in healthy and useful directions, often according to personal bent and the prominence of certain faculties: and to strive not so much to work the brain as to train it to develop the faculties of observation, mind storing, memorizing and reasoning. Mere knowledge is not brain training, but brain burdening. The mind should be educated to think afresh.

f Rest and recreation are essential for healthy and especially for prolonged and deep brain work. Like every other organ in the body, the heart, lungs, stomach, &c., the individual brain can only accomplish a certain amount of healthy work in a given time. If forced to do more the brain lags like these, and breaks down by doing faulty work. The mentation is inferior or erroneous, and the thought-generating organ fails to respond and proceed in healthy fashion. Moreover, brain tissue requires, like other tissues, and more than these in correspondence with its delicacy, rest and time to recuperate and rehabilitate its fibres and cells wasted by mentation, as the physiological process and evolution of every thought involves and implies the employment and expenditure or waste of brain tissue to make the thought, oxygen to develop it, and plastic blood to reconstruct the lately expended brain tissue. Excessive and especially prolonged mentation induces brain-tire or weariness, and is as unwise for the brain as over-working or walking for the muscular system and the body. Hence brain work, whether exerted for business or study, should be occasionally intermitted: and, better still, varied by some other brain or brain and body recreation or change of work, study or occupation or amusement. Most people have some favourite pursuit or hobby, music, art, literature, or some of the many different forms of physical exercise, gymnastics, calisthenics, rowing, and others that may be utilized to occasionally relax the wearied mental organ. Sometimes a little, even a few minutes' sleep will do this better than anything else, and refresh the brain for new efforts. The full night's rest of body and brain in sleep and brain oblivion is essential to all brain workers. The weekly seventh day's rest is equally necessary and beneficial. An occasional holiday, as required, and involving total change of scene, faces, diet, occupation, books, &c., and of the entire human environment, is also a most important item

to make and prolong a healthy brain and healthy cerebration.

But on the other hand, under-work or brain-sloth or idleness is also unwise. It is when unoccupied in healthy thought that evil usually enters in enticing and cunning ways and alluring methods, it may be to our undoing in many ways. Understudy, mental inertia, or laziness are also physiologically and functionally prejudicial, and therefore wrong; inasmuch as imperfect brain health and inferior mentation and mental development may thereby result. Mental indolence, so to speak, shrivels up the intellect and talents. While thereby the moral and spiritual culture are also apt to be more or less neglected indirectly. Idleness and apathy are the moth and rust sure to corrupt one of the greatest of our earthly treasures, the intellect. These are the thieves that are most apt to break through and steal away our brains piecemeal; and by degrees cause the noblest of all our organs and tissues to decay; not only in individuals, but also among nations, and even the races; facts of self-evident importance and application. The brain grows by use, not in size perhaps, but in quality and intelligence; and if not habitually employed it necessarily sinks into subordinate importance in the body, and from being its leading organ and ruling member, it goes in the background; and with it its owner. The amount of mental labour in which we can safely indulge, as already indicated, cannot be weighed, measured, or apportioned according to unbending law, for obvious reasons; and is clearly left mainly to our individual parental or medical judgment and guidance. Some, as with body toil, can stand more and others less, without detriment either to the health and vigour either of brain or body. Judicious and healthy brain culture is ennobling; and beneficial not only to the individual, but occasionally indirectly to the community, of which he is a member, and to the race at large. It is unquestionably not the hand but the brain, not the sword but the pen, and not matter but mind that rules the world. It will be increasingly so, as the number of thinking minds is on the increase, and of combative ones on the wane. To use the talents we each possess, and to incite others to do the same, by our good example, is our manifest duty, not only for our worldly prosperity and happiness, but for our health and for the prevention of disease.

g Mental work and the mental rest that we term amusement or recreation ought to be duly apportioned to suit individual requirements and necessities. Too much physical exertion is apt indirectly to depress the brain and its mentation: just as too heavy or prolonged mental labour ennervates the body. Too little of both is equally injurious to both. It can no longer

be said to be a question whether or not physical training should be a branch of, go hand-in-hand with, mental education. Physical training, education, or brain work, and recuperative rest of body and brain, should all be carefully regulated, especially during the immature periods of life, when the body and the brain are still both texturally and functionally undeveloped.

h That heredity is a prominent factor in the mental environment is proved by Hebrew history; even if we put the two greatest examples aside as beings who were specially gifted. The intellect of Jesus, like Himself, was Divine; although it operated through a human body and brain. That of Moses, though human, was unusually gifted for a special purpose (Ex. iv.). But the intellects of the great Hebrew leaders and ancestors of ancient times were lofty, clear, and strong; worthy of that of their chief "Father" Abraham (Gen. xxxii. 9), the "friend of God" (Is. xli. 8). And, as a rule, the Jews ever since and even now are examples of clear and healthy secular mentation, that manifests no sign of deterioration.

These considerations in the aggregate render it apparent that as with the body generally and its hygiene, so with the brain; it is not one or two, but many factors, that are necessary for and combine to make and keep its strength and its special function, mentation, healthy and vigorous.

The Mental Hygiene of the Holy Scriptures

The Bible, from beginning to end, is replete with mental philosophy, in the form of direct and indirect hints, allusions, maxims, parables, and types; and of mental hygiene or health hints for the human mind and its chief organ, the brain. One of the multiform aims of the Holy Scriptures and one of its most important ones, not only as a hygienic hand-book but in its far wider general scope, is to generate and promote healthy mentation, cerebration, or thinking on matters concerning man's earthly existence; especially as to what human beings really are, individually and collectively; what their place in creation is; what human existence really means; what Nature is; the relation of individuals to their fellow creatures, and, above all, to their Creator. By these Bible perusal and study tend to promote the right and healthy action and life which can alone spring from and follow just thought; inasmuch as it aims at preventing unhealthy or sinful mentation, whether springing from the individual mind, or instilled by faulty ideas of morbid

literature, unwise companionship, or evil instilled by Satan and his emissaries. By thus aiding and suggesting and shewing the beauty and the benefits of healthy thinking, the Bible leads to healthy speaking and acting, and to the promotion of just living, such as is most likely to promote our highest and best interests for time and for eternity by inducing us to abhor and to shun evil, and follow that which is good, that is godly.

It must be evident that to promote right, that is pure, upright, and wise thinking, we must have a healthy, well-balanced brain; just as for good sight it is necessary to have perfect eyes. Like the other bodily organs, it must have a healthy environment in the shape of food, liquid, rest, and so forth; as the Bible informs us, and narrates of what that should consist: as detailed in the chapters specially devoted to those subjects (Chapters 2, 3, and 4).

The Holy Scriptures warn strongly against excessive mental work thus: "Neither make thyself overwise; why should'st thou destroy thyself?" (Eccles. vii. 17). To fully understand this we must remember that the sixth commandment, "thou shalt not kill," applies to the individual as well as to his neighbour. No man has either right or permission to kill himself any more than he has to slay another person. Overstudy has often induced deadly disease, and many serious ailments, especially nervous ones, such as brain exhaustion, sleeplessness, irritability, neurasthenia, hypochondria, melancholia, and even other forms of brain disease and insanity have resulted from this cause, leading perhaps to suicide or self-destruction in various ways, a frequent record in human history. And even when this deplorable acme has not been reached, many a man has found, like Solomon, himself a scholar, that "much study is a weariness of the flesh" (Eccles xii. 12); inasmuch as excessive brain work frets and wears the body out, and is especially detrimental to the all-important brain and the general nervous system, causing lassitude, headache, sleeplessness, nervous irritation, general deterioration of health, and at last and directly to many severe and tedious ailments.

Healthy mentation, the emanation or function of the healthy brain, is one of the most important results of human life. Of infinitely greater import is it that this should be wise, *i.e.*, psychologically healthy. Secular history and biography furnish no instance of perfectly wise and just mentation, and its results in upright and well-ordered human conduct during an entire lifetime. On the other hand, sacred history gives only one example; and that is in the case of the sole model man that earth has yet seen or is likely ever to behold; He who volunteered in complete self-sacrifice not only to save rebel man, but also to teach him how to live and think and act properly; and

proved by His own conduct that it is perfectly possibly even for fallen beings like us to do so in spite of our human, innate, or self-acquired tendencies to err. But with the exception of that example the Holy Scriptures, so full of well chosen and educational biography, is a long, sad, yet intentionally given record of unwise and unhealthy mentation, mainly the result of self-generated or instilled evil ideas, and their sad results both on individuals and nations: one and all of them the result of the introduction into humanity of that gigantic evil, sin, and its disastrously morbific effects on the human body, mind, heart, morals, and soul; in one and all of which it has, ever since the Fall, led, except when wisely combated, to its manifold disastrous secondary results, disease and death. Indeed, ever since that untoward and far-reaching event, the Fall, and its main factor, the allurement to sin; this lapse and disobedience has but foreshadowed and been the forerunner and prototype of myriads of similar offences in every epoch, clime, country, and condition of life, shewing that humankind throughout has inherited their first parents' weakness, and are as simple, easily led astray, and foolish as they were, and have no right to cast stones at them. So that it may be safely affirmed that no individual has ever since lived, with the one great exception, that has not committed one, nay many, major and minor errors, resulting from faulty mentation, and often suffered the direct or indirect consequences thereof. Indeed, in many cases, life has been a continued succession of mistakes of erroneous and morbid thinking; followed by its almost unfailing punishments, physiological, moral, social, and spiritual, of the individual transgressor (Rom. iii. 24). What is true of persons holds good regarding nations and communities. Erroneous mentation, followed by faulty life, are punitive. Sins of neglected intellectual hygiene and of a faulty mental environment are as certain to induce disaster, as are aberrations of the physical and physiological hygiene of the body.

The histories, even though briefly given, of Adam, Eve, Cain, Noah, Solomon, David, and even of the more God-fearing of the Bible worthies, such as Abraham, Isaac, Jacob, Aaron, Moses, and many others of the Scripture era, give examples of much grievously morbid mentation, and unwise thought followed, as usually happens, by foolish and sinful action, moral and spiritual turpitude. So also among nations. Jewish Bible history may be cited as, for several reasons, perhaps the best example of unwise and sinful mentation, the result mainly of unbelief or mistrust in their Leader, Instructor, God, and Guide, Jehovah, aided largely by self-will, which has resulted, among other evils of even more deplorable nature, in the scattering and denationalizing of a once glorified and famous people; now

forced to seek individual homes all over the globe; often where they are unwelcome and barely tolerated. Among those who had no such special marks of favour as had the Hebrews the results are even more marked. It was faulty mentation that led to the Flood and the Dispersion, far-reaching calamities. Secular history is full of like examples of faulty thought and its results to nations and their kings and statesmen.

The Holy Scriptures are full of advice, that if known, accepted, and carefully followed, would have counteracted all this. The decalogue consists of crystallized wisdom, meant to teach wise thought and action not only to individuals, but nations; and the race as well as the Hebrews. The Scriptures, from Genesis to Revelation, are replete with the greatest thoughts, directly or indirectly from the Master-mind and Wisdom itself, and on almost every conceivable theme; but mainly on practical subjects that concern humanity, and human life, and its proper guidance, so as to please Him by whom we were placed on this planet. To all this the sayings and doings of the Saviour, as recorded in the New Testament, form a fitting sequel: for where can greater, deeper, or more practical and far-reaching thoughts be found for human kind to follow and strive to imitate, so as at the same time to benefit themselves and the race. The best mental philosophy extant is that of Jehovah and His Holy Scriptures. These form the best guides and models for healthy, *i.e.*, wise and common-sense human thought.

CHAPTER XIII

MORAL HYGIENE

"A sound heart is the life of the flesh" (Prov. xiv. 30; Ezek. xviii. 31; Jer. xvii. 9; Ps. xliv. 1).

The thoughts which the human brain begets are not altogether or purely intellectual, but are largely and perhaps oftenest of a moral nature. Man is a moral as well as an intellectual being. His moral feelings often dominate his entire existence; and shew plainly that he bears certain relations towards and owes certain duties to the great moral Governor of that universe of which we individually form an integral part; as well as to our fellow men; and to our own present and our future. Our individual, communal, national, and racial morality or moral standard is the sum total of our moral thoughts and deeds. This may be either high or low, good, bad, or indifferent. Unquestionably our human morality is of far greater moment than our intellectuality, from every point of view. The same outer or grey matter of the brain no doubt produces both varieties of thought, and correlates them.

Like the intellectual, so with the moral faculties, begotten by and emanating from the same single organ, the brain, they are multiform. Analyzed as a moral being, the human mind may beget one or all of the following characteristics and often interdependent varieties of moral mentation:—

1st. Certain *desires*, such as *a*, animal desires; *b*, avarice; *c*, ambition; *d*, emulation; *e*, love of society; *f*, love of esteem or approbation; *g*, love of knowledge; *h*, love of moral improvement; *k*, love for action.

2nd. Certain *affections*.

1st. Justice. *a*, integrity towards others; *b*, freedom of action of others; *c*, reputation of others; *d*, conduct and character of others; *e*, opinion of others (candour); *f*, feelings of others; *g*, moral condition of others.

2nd. Compassion and benevolence. *a*, to others' distresses; *b*, to others' reputation; *c*, to others' character and conduct (forgiveness); *d*, to others' feelings; to others' moral condition.

3rd. Veracity. *a*, love of truth; *b*, sincerity; *c*, fulfilment of promises.
4th. Friendship, love, and gratitude.
5th. Patriotism.
6th. Domestic affections, including the defensive affections, anger, jealousy, resentment.
7th. Self-love; selfishness; self-denial or abnegation.
8th. The moral relation of Man to God.
9th. The will as one controlling agent.
10th. The moral principle or conscience.

As this is not an exhaustive treatise on moral philosophy, it will suffice to give only these heads of subjects. But these will suffice to shew that mentation in moral matters involves a larger number of mental factors than does mentation of a purely intellectual nature; and altogether appears a more complex affair, inasmuch as all of these many moral factors have to work together harmoniously to produce satisfactory and creditable results. Moreover, with a healthy brain, the moral feelings and intellectual faculties ought to work together harmoniously. While, again, both ought also to harmonize with the still loftier spiritual mentation of the soul; with the life of which it is indeed impossible to disassociate them. Moreover, the moral feelings ought to be apportioned to and harmonize with the frame; on which undue excitement of the former soon re-acts; as also does over work of the frame on the moral feelings.

By the right and healthy or unhealthy action, inter-action, and correlation of these different moral factors, our moral conduct is individually swayed for good or for evil; and, with the resulting speech and action contribute to form the character. Man is a free agent, and our character is largely, nay mainly, in our keeping. It is a talent given to educate, develop, and tend; and for which we shall individually be called to account when our earthly life probation ends. Hence it is one of our chief duties, first to make and then to keep, an irreproachable character; and one of our chief interests, both earthly and eternal. Our desires and instincts were heaven implanted; but from sinful tendencies they are too apt to run riot. Hence they must be controlled and kept from excess. It is with these moral faculties as it is with many other hygienic factors already spoken of, such as food, drink, exercise, &c., and even intellectual ones like study; the rule regarding their cultivation, is to use moderation (Phil. iv. 5).

It is obviously most important that our conviction of moral responsibility to God, to ourselves, to our fellow creatures, and to the world of life around us; and thus that our moral mentation should be healthy and strong; that is, that it should be wise, just, sound, and good; and that it should be followed by

corresponding action in word and deed. For to think morally, and not to speak and act likewise, is faulty. To attain this desirable object proper conditions and a certain environment is necessary. Otherwise we may, even with a healthy brain, originate unhealthy moral feelings; and thus think and act unwisely towards ourselves, our fellow creatures, or our Creator. To prevent morbid derangement of the moral faculties like this, is therefore an important matter for time and for eternity; regarded from a Christian standpoint. Healthy and wise morality is such as we have no occasion to hide and no occasion to feel ashamed of before our fellow-men or God. The study of this, the best conditions for healthy morality in thought, word, and deed, and of the best moral environment for human beings generally, is termed moral hygiene.

The following are the chief circumstances likely to affect the result:—

1st. A healthy brain and body; the best of all parental legacies. The moral emanations of an imperfect, malformed or diseased brain are apt to be unsatisfactory, crude, or morbid.

2nd. The good example of parents, selected friends, and companions; so much more important even than precept: at all ages, especially at the early stages of life.

3rd. Education and the cultivation of knowledge should be such as to instil and inculcate moral thoughts and habits. The selection of books is important; and of these none is for a moment to be compared to that compendium and encyclopædia of morality, the Holy Scriptures.

4th. As a sequel to the Bible study is the necessary petition for the promised Divine aid to promote our evolutionary education in the highest morality.

5th. A habitual effort is also necessary to cultivate a sense of the Divine presence, and a desire to regulate our moral feelings and character by it.

6th. A strict guard should be kept over the moral principle or conscience, that just balance which in a well-regulated mind controls and regulates the mind.

7th. Full acquiescence in and submission to God's decrees.

8th. The cultivation of a sense of innate and congenital and hereditary moral imperfection and depravity and guilt; and the necessity for supplication for mercy; with reliance on promised Divine aid therein.

9th. A sense of gratitude, affection, and love towards God as the giver and preserver and guide of all.

10th. A sense of faith and truth in God; and in all He has already and will yet decree.

11th. The cultivation of the sense of harmony apparent between Christian truth and the moral feelings.

By these means strenuously cultivated we may rise into higher planes of thought than the usual earthly ones, and into a purer and more ennobling moral atmosphere. For just as it is the fogs, mists, and impurities of the lower atmosphere which most besoil our bodies, and as we escape these by rising into more elevated regions; so it is the denser lower worldly strata of life which carry with them moral depravity, disease, and death, from which we are most likely to escape by rising into a self-elected, more elevated, and purer moral atmosphere, such as here defined.

It would be impossible to go over the entire ground regarding morality, its observance, and its aberrations: but well to allude mainly, though briefly, to one of the failings which most besets the human race as a whole. The following conclusions of medical men regarding morality and moral hygiene may be deemed orthodox; and are aimed chiefly at the grosser human impulses; those which in excess lead to the direst havoc to body, heart, brain, and soul, nay, the entire being and the whole life; a calamity which unfortunately may be hereditarily transmitted, and thus seriously influence succeeding generations. But the suggestive lesson is equally applicable to other and even to the minor aberrations.

1. Chastity does no harm to the human soul, mind, heart, or body; but, on the contrary, much good, disciplinary and otherwise, in mental, moral, social, and spiritual directions.
2. No man was ever anything but better, physically, morally, socially, mentally, and spiritually, for perfect continence.
3. No man was ever yet the slightest degree better for incontinence in any matter.
4. Most men are physically worse, often indeed completely ship-wrecked; and all are worse, morally, socially, and spiritually for incontinence.
5. The medical thus joins with the clerical in not even giving silent sanction to incontinence; but resolutely set their faces and raise their voices against it, and proscribe it as firmly as they would theft, lying, or other moral delinquencies.

The punishments usually awarded secularly to moral delinquencies are various and according to the nature and intensity of the aberration or crime. But all of them are intentionally remedial and reformatory in their nature. These punishments may be legal, as for murder, theft, &c.; but this is beyond our theme. Hygienically we have more to do with the pathological

or medical punishments, and their prevention, by opposing the moral causes of these. These bodily ailments are frequent sequelae of broken or infringed moral laws, especially where the desires and passions are permitted to run riot, particularly in licentiousness and immorality; results that lead both directly and indirectly to much disease, mental and bodily, in which, unfortunately, not only the individual first implicated, but even families, tribes, and nations may ultimately be involved.

Although aberrations of the moral faculties come largely into the domain of the Divine, necessitating both good example and advice; still far more do they encroach on the province of the physician, and that in all their different grades of intensity and variety. Medical men have much to do with moral perturbations and their results, in the general community; more especially with the diseases that flow therefrom; a numerous train, including, for example, the many that follow excesses in drink and lust, and worst of all their major manifestations and other varieties of mental aberration, and even more complete mental alienation, such as kleptomania, pyromania, erotomania, and many other varieties of alienation of the moral faculties. It is therefore the rôle of the physician to make a special study of these; to investigate their causes; what may prevent them; and the surroundings and conditions best fitted to promote this most important object, a judicious moral regimen and hygiene.

One of the most pleasing features of the present century, as contrasted with former eras, is the marked change in our ideas regarding moral depravities, moral culprits, and their treatment. This change is ascribed to modern enlightenment. But both are alike due not to secular but to sacred light; and the clear teaching of the Holy Scriptures, as searching and practical in moral as well as in body hygiene. For whereas formerly moral delinquencies were regarded as criminal, and punished accordingly; their victims are now deemed sufferers either from imperfectly developed or diseased brain manifestations, and are treated more as patients than culprits, and pitied more than punished; while by education and kindness attempts are made to shew these unfortunates the benefits and happiness that flow from a stricter morality than that which they have hitherto failed to understand. To these enlightened modern ideas we owe diminished punishments of criminals and improved prison treatment. To them also we owe reformatories, ragged schools, and homes for the morally weak and the endangered. To them also we owe an increased interest in public education and the innumerable forms of public philanthropy. All of this and far more we owe to the influence of the Holy Scriptures, and above all that which towers far above all the rest, the educational leavening influence of the life of Jesus, who came to seek and

to save the morally and spiritually lost; who not only practised this Himself and went about continually doing good; but left us invaluable advice how we might do so likewise, and taught us that it is our duty and privilege and interest to follow in his footsteps and do likewise. Thus we may individually and collectively aid the Creator and the Saviour in educating and elevating the race, morally and socially, and emancipating them from the chains and thraldom of sin and its manifold results, brought on ourselves by our own moral and spiritual obliquity of constant repetition, as well as by the early aberration of our first parents.

It perhaps comes oftener in the lot of the physician than the Divine to aid the morally erring by judicious advice to shew not only how to cure his errors, but, better still, to prevent their repetition by a wiser conduct and healthier moral environment. By this, superadded to Divine aid and indispensable self-help, these may "build themselves up" (1 Thes. v. 11), and ultimately recuperate and rehabilitate their disjointed moral faculties, and become what a sane and wise human being ought to be, and we should all strive hard to become. In aiding this moral reform the conscience is a potent factor.

From a general, and especially from a medical and philanthropic point of view, it will therefore be interesting to find out what this wonderful volume, the Holy Scriptures, to which mankind solely owes the initiation, development, maintenance, and constantly-increasing world-wide philanthropy and interest in moral turpitude and moral culprits, of comparatively recent growth, and so prominent at the present day, says on the entire subject of morality generally. It will shew, among other points, how many centuries Bible-teaching antedates our modern development; and how very far the former is still ahead of the latter in all those lofty moral ideas and ideals that have recently blossomed so benignantly in Christian lands and begotten such widespread love, charity, peace, and goodwill towards our fellow creatures, especially to such as are "out of the way" (Is. xxviii. 7); and opened the moral and spiritual eyes of Bible believers to see that even they themselves are at best only "poor, weak, miserable, blind, and naked," and themselves also require help and tuition in moral matters. Herein we find another and fresh impetus to the study of Holy Writ.

Biblical Moral Hygiene

The Holy Scriptures speak far oftener and also far more forcibly regarding moral than intellectual matters and mental hygiene; thereby clearly indicating their relative importance.

Indeed, one of the great objects for which the Bible was bequeathed to the human race was to furnish them with, teach them, and shew them the importance of and the great value in Jehovah's sight of a lofty, moral ideal as a part, offshoot, sequel, ally, and proof of a high plane of spirituality; that which He desires for Man, and would fain aid him to reach and live up to as the happiest and best. The majority of our fellow-creatures are not likely to err, although individuals occasionally may, regarding mental over-strain. But the majority may, and do often, seriously err on the score of morality, and pass the bounds of wisdom not in one or even a few but in many of its component factors.

No inconsiderable part of the earlier Bible record and Old Testament narrative is taken up with a recital of the moral follies and sins of humanity; to shew their turpitude and indicate how important it is to strive hard to avoid and eschew what is so obnoxious to God, our Maker and our Owner; after whose directions and ideal life we should therefore live in order to attain this.

Indeed, the Bible from beginning to end is encyclopædically full of morality, and illustrates the subject in all its phases and grades of intensity, from the small initial aberration to the grievous major sin. And, moreover, illustrates and teaches by codes, maxims, biographies, anecdotes, parables, and personal examples. Thus the Decalogue or Ten Commandmends, which forms the most pithy, pointed, and best moral code extant or that could be devised, was framed by God alone, written on two tables of stone by His own finger, and thus in every way His own conception and work, and worthy of Him for comprehensiveness; forms the chief corner stone on and round which all the rest of the Bible morality is built. In this code we find for certain of the most frequent and grave moral sins definite laws laid down, *e.g.*, for murder, theft, lying, slander, idolatry, &c. While illustrations are given elsewhere of the actual occurrence and practical outcome of these greater sins, the result of moral diseased conditions resulting from culpable excess of the ordinary moral faculties formerly catalogued. These laws are as far superior to those that human moral philosophers could devise, as Heaven is above Earth; for Jehovah's laws are "perfect": while ours are faulty, partial, and short-sighted. Moreover, they necessarily aim also at the prevention of the lesser or minor sins, and indeed at all the grades of these aberrations of these varieties of immorality. Then, too, as now, the sins most frequently committed among mankind were the sexual; and these are accordingly spoken of at great length, and their sad consequences pointed out and illustrated.

To these the moral maxims, sermons, parables, and reproofs

of the Saviour form a fitting sequel and copestone; and include moral inculcations of the deepest import, and highest value; such as, if fully and continuously followed by all would make a heaven of earth and saints of thousands of sin-struck men. By these the various forms of doctrine and moral teaching, by which He reached the human heart, whose guile and depravity he had learnt to know so well by His human life, which shewed Him what was in man (John ii. 25), He illustrates many a variety, shade, and degree of moral degeneracy; and directly or indirectly points out that the hygienic or preventive remedy was to follow Him, take up His cross, live, think, act, and speak as He did; fully receive and strictly obey God's moral laws, great and small, and prove by our deeds and works that we are indeed His true disciples and servants. He specially points out that while good works or actions conjoined with and a sequel to and proof of faith in Him, are acceptable and well-pleasing to Him; works alone, and lacking this great essential, faith, are "dead" (1 Thess. v. 8; Jas. ii. 17), and worthless in His eyes. Jehovah cannot be deceived; nor will He brook the attempt (Gal. vi. 7).

The Bible throughout is a storehouse of narratives, biographies, and anecdotes of points illustrative of the various forms and degrees of moral turpitude, even on the part of those who lived a God-illuminated life in God-ignoring times and regions; but were yet themselves occasionally led into sin, although honoured by God to be instrumental in contributing to form immortal Bible history, ethnology, and the story of creation. Every one of these Bible notables, from Adam and Eve downwards, sinned, often grievously, and in various ways. Even Abraham, the "friend" of God (Is. xli. 8); Moses, the "Man of God," and His chosen servant (1 Chron. vi. 49); David, the man after God's own heart, were grievous, moral culprits. With the conduct of two, Enoch (Heb. xi. 5) and Elijah (2 Kings ii. 11) God was so pleased that He "took them and they were not" (Gen. v. 24). No doubt they, too, had their moral and spiritual aberrations, but so slightly and so well fought against and "overcome" that they merited the approval of the great Heart-searcher and the All-seeing, and so made ensamples for us to copy.

Only one of the Bible biographies gives us an ensample of a perfect human being and pattern life; the only model that has ever lived; whose earthly career was as rounded, faultless and perfect as are all His laws, methods, and works: and that was the story of Him who came not only to atone for sin but also to teach us moral hygiene, how best to prevent moral aberrations and turpitude in all their forms and degrees of intensity; not only the great sins of the Decalogue, which most men can

easily avoid, but also the little sins which so beset and drag us still lower when unopposed. Jesus was a very man, mortal, human, and subject to like passions as ourselves. It was therefore possible for Him to sin and fall as Adam did, and as we all do. As a man he *could* have sinned according to human nature; but he *would* not. He had the will-power and strength to resist, that we so often lack and therefore fall. Is this an unapproachable ideal, a dream life, visionary, utopian, and impossible for any man to imitate? Nay, Christ followed it effectually and supremely; and tells us how we can and that we may do the same. To shew us that such an irreproachable life is possible was part of His earthly mission. Jehovah is no visionary to put before us and make us do what humanity cannot accomplish, if we only try and invite His aid. It may happen that we may not succeed in becoming perfectly pure, holy, and morally guiltless, like Him, and do all that He bids to oppose the sinful suggestion, promptings, and thoughts, when the temptation is strong and alluring. That life, which Christians ought especially to follow, is the best hygienic or preventive opponent of that moral obliquity and turpitude which, in all its degrees and phases, is so offensive and hateful to God and so disastrous to us; and by indulgence in, or opposition to, which we shall be largely judged and condemned or reprieved at the great and public bar of heavenly justice. We cannot, alas, always do exactly what God would have us to do, say, and think. We cannot always become exactly what He would have us; or what we ourselves would wish to be. But though we cannot always succeed or fully do all we fain would, will not the desire and the attempt to do His will be to our credit, and welcome in the eyes of Him who knows the frailties of our frame (Ps. ciii. 14), knows that we are but dust (Ps. ciii. 14), and realizes our trials and temptations, having had like passions as ourselves (Heb. iv. 15)? Will not our frequent falling occur less often and less seriously each time we "arise and go to our Father" (Luke xv. 18); and, once more forgiven, walk along a higher and less dangerous plane, striving all the harder to become more like the Saviour; and taking Him as our model, live ever day by day more nearly as He did, living in and with Him, and by Him gaining strength to resist temptation, and increasing in moral health and purity.

It would be impossible in brief space to do full justice to the wide subject of the moral hygiene of Scripture. But still it will be well to mention a few of its leading features and salient landmarks. The sum and substance of these may be said to be this: that morality alone, though good, wise, and healthy in itself, is not all that is necessary for man, and therefore not alone sufficient to please God, if we are spiritually wrong and

unhealthy or deficient in soul vitality. A human being may be strictly and conscientiously moral, and yet unholy, not pleasing to, and still far from the Kingdom of God. Morality is one of the tests, proofs, and necessary sequels to Godliness. No true Godliness can exist without strict morality. Morality lacking religion is the sounding brass and tinkling cymbal of a pseudo hypocritical godliness, which may deceive man, but not God.

In the Holy Scriptures we find mentioned no fewer than 42 moral manifestations which are decidedly sinful or that may, by excess become morbid, and thus amount to moral disease and sin; against which we therefore ought to strive, and by moral hygiene and preventive measures forestall the inception of or minimize. Many of these are exemplified by apposite narratives of their occurrence and consequences, but these we cannot follow fully. Here it will be expedient to confine our attention to those aberrations which come most under the eye of the physician, and often give rise to medical and surgical results; namely aberrations, weaknesses, faults, and sins of sexual morality, amounting to immorality and licentiousness.

We glean first and chiefly from the Bible narrative how rampant and widespread gross sexual immorality in every shape was in the earlier stages of human history and Old Testament times, before the moral law was delivered to the Jews, by whom it was to become the world's legacy. The importance of a strict and constant pursuit of morality on the part of all is shewn by the frequency with which the subject is reverted to in every possible shape and form, especially throughout the story of the Wanderings, as well as in Hebrew history both before and after that event. In this both the great and the minor lapses are amply and aptly illustrated by examples, in which even God's own chosen people and agents are not screened but made to play a leading part; and forcible examples pointedly and plainly expressed of turpitude, are given to shew how weak human nature is, how few are perfect, how easily even the Godly are led astray by Satan and congenital depravity, and that all, even Christians, require to be ever on the alert to avoid a fall. This plain speaking indicates the importance of morality in God's sight; because moral turpitude defiles the soul, and thus becomes a heinous sin, no matter what its form may be.

Jehovah could read the lesson of past human history, including that of the Hebrews from Abram downwards; and so knew and inculcated forcibly and wished His chosen pupil-people to learn specially that it is as important for human health to have a clean and pure mind, morals, and heart, as it is to have a clean body, and even more so. And so He enforces

it, not merely for sanitary reasons, but also for a symbolic aim and to indicate the interdependence of soul, mind, and heart matters and hygiene. Jehovah knew and knows now what militates against human moral health and what helps to promote moral salubrity and vigour. He thus desired His chosen pupils, the Hebrews, as He likewise desires us, to be clean and pure in all matters, tangible and intangible; physical, corporeal, social, mental, moral, spiritual; individual and communal. Their food, drink, atmosphere, houses, bodies, streets, tabernacle; their heart, mind, soul, and their worship were all alike to be as far as possible free from earthly taint and pollution. And therefore not a law was forgotten or left out in their many-sided and far-reaching system of hygiene or sanitation to effect this comprehensive and beneficent purpose. And the hygienic rules He formulated to enable them to curb their animal passions and proclivities, applied more or less to the subjection and control of every other moral and immoral tendency, when these are likely to become excessive and pass beyond individual restraint and merge into license.

Sexual hygiene is approached in the Holy Scriptures with reverence and delicacy; and, viewed from a spiritual standpoint, that of the sanctuary (Lev. xv. 31), not with the comparative business-like indifference of lay medicine, it seems to include personal purity, both moral and physical, and to aim at the preservation of the entire race; views which modern medicine are gradually following. Public is largely the sum total of individual hygiene. Like the pre-Exodial Israelites, who were forbidden to follow or imitate the doings of the Egyptians among whom they dwelt, or to be similarly led by the Canaanites; so those of the Wanderings and after days are expected, like ourselves, to follow God's command, "ye shall do my judgments and keep mine ordinances and my judgments, which if a man do he shall live in them" (Lev. xviii. 4-5). Firm laws and definite practical objects were necessary then as now to induce or compel obedience.

Leviticus (Chap. 18, 19, and 20) contain certain minute and important rules to inculcate the highest decency, morality, and chastity, and possible physical, and therefore moral, social, and spiritual defilements therefrom. These are best studied in the original text; and require no comment, as their meaning and importance are evident. But it is well here to note the reason given for their inculcation. "Defile not ye yourselves in any of these things; for in all these the nations are defiled, which I cast out before you; and the land is defiled: therefore I do visit the iniquity thereof upon it, and the land itself vomiteth out her inhabitants" (Lev. xviii. 24-6). The sins here spoken of are wicked in God's sight; productive of physical deteriora-

tion among individuals, and tribal and national decrease of population; grievous errors. Jehovah therefore still further emphasizes His command, "Ye shall not commit any of these abominations; that the land spue not you out also when ye defile it, as it spued out the nations that were before you" (Lev. xviii. 28-29). The heavy individual penalty for disobedience was that they "shall be cut off from among their people" (Lev. xviii. 30). The reason of the law is plainly given, "that there be no wickedness among you" (Lev. xiv. 20). And, again, "Ye shall be holy, for I the Lord your God am holy" (Lev. xix. 2). He desired purity in thought and deed.

Again in Deuteronomy xxii. various important points are spoken of regarding masculine and feminine purity, unchastity, and the morality of marriage. The Hebrew laws shew how much religion, then guarded as it still guards the social and temporal interests of Man. They are enforced with awful and solemn penalties, meant to punish the perpetrator of crime, while they protect the victim; and they include stoning to death, shewing how hateful sensual sins are to God, and how stringent the early Hebrew law was regarding this. Deuteronomy xxiii. 2 shews the same hatred of impurity, and its punishment even on the personally innocent and unoffending. Illegitimate men or women were not permitted to "enter into the congregation of the Lord" even to the "tenth generation," which practically meant for ever. They were thus treated like aliens and idolaters, as were the Ammonites and Moabites mentioned in next verse. All impropriety of females and bestiality among males was strictly forbidden (Deut. xxiii. 17). It was largely to endorse and encourage chastity that marriage, long previously instituted by the Supreme Moral Ruler of Mankind was emphasized by the Mosaic code. Still further to promote moral cleanliness and hygiene among the Hebrews, strict, just, and circumspect conduct towards near of kin was inculcated, and our duty to ourselves, neighbours, and God, by pointing out plainly, yet forcibly, how human beings may sin grievously. These hints in the Mosaic law (Lev. xviii. 6) include crimes against which healthy and sane human nature instinctively recoils; and which only excite shame and disgust and usually instil mutual antipathy. To promote racial and rational health, and also largely to promote moral purity in families, certain relationships are pointed out which bar the slightest sexual impropriety. Thus against a

Father (Lev. xviii. 6-7).
Mother (Lev. xviii. 6-7).
Father's wife (Lev. xviii. 8).
Sister, Sister-in-law } (Lev. xviii. 9).

Son's daughter } (Lev. xviii. 10).
Daughter's do. }
Father's wife's daughter (Lev. xviii. 11).
Father's sister (Lev. xviii. 12).
Mother's sister (Lev. xviii. 13).
Father's brother } (Lev. xviii. 14).
Do. do. wife }
Daughter-in-law (Lev. xviii. 15).
Brother's wife (Lev. xviii. 16).
A woman and her daughter } (Lev. xviii. 17).
Or son's daughter }
Or daughter's daughter }
Wife's sister (Lev. xviii. 18).

The same circumspection had to be observed, and for the same object, namely, the promotion of moral hygiene towards all women at certain periods of their life (Lev. xviii. 19). The Hebrews had to be circumspect towards their neighbour's wives (Lev. xviii. 19-23); also towards mankind generally (Lev. xviii. 22); and likewise towards the brute creation (Lev. xx. 13; Lev. xviii. 19-23; xx. 15-16). Had these not been plainly mentioned and forbidden, the Hebrews might have pled lack of law as an excuse. These rules were necessary to prevent the contamination of neighbouring nations "for in all these are the nations defiled which I cast out before you" (Lev. xviii. 24). "For all these abominations have the men of the land done which were before you" (Lev. xviii. 27-28). The punishment for disobedience is also noticeable, "lest the land spue you out also when ye defile it, as it spued out the nations that were before you" (Lev. xviii. 18). "The souls that commit them shall be cut off from among their people." Bestiality was as abominable then as it still is. Moreover, to still further inculcate moral and social and therefore spiritual purity and cleanliness among the Hebrews, a clean and true physiological manner of life among the lower animals was commanded. By this they were required to put a difference between clean and unclean beasts, clean and unclean fowls, "and ye shall not make your souls abominable by beast or by fowl or by any manner of living thing that creepeth or moveth on the ground, for I the Lord am holy and have severed you from other people that ye should be mine" (Lev. xx. 26).

The Mosaic laws regarding other breaches of morality such as murder, theft, lying, and the punishments for these, either in the form of great and little sins, were as complete and stringent as those regarding sexual morality. But these matters are more legal than medical and hygienic; and may not be discussed here. But to illustrate how minute and complete was the

Mosaic moral code, only one more item may be instanced, namely, inconsiderate oaths, meant either for evil or for good. When their folly was discovered by the person it had to be atoned for by the priest offering a trespass and sin offering; by which the habit of the strictest truthfulness was inculcated (Lev. v. 1-6).

The *punishments* for moral obliquity and infringements of the moral law need only be briefly alluded to, and solely because sometimes medical and therefore of sanitary import. Jehovah is the supreme judge, law maker, and punitive inflictor. The Holy Scriptures shew that He punishes men, families, tribes, communities and nations in various ways for moral sins, according to their nature and gravity; and also that justice is sure, sooner or later, to follow broken moral laws: in the present or in the future, here or hereafter; and, alas, not only to himself but to others. Individual moral sins and their consequences and reprisal are frequently illustrated in the Holy Scriptures for hygienic or preventive purposes, to warn and caution us to avoid them. For example, that of Adam and Eve (Gen. iii.); Cain (Gen. iv. 9); Noah (Gen. ix. 20-24); Abraham (Gen. xii. 12); Isaac (Gen. xxvi. 6); Jacob xxvii. 19); Moses (Numb. xx. 9); Aaron (Ex. xxxii. 2); David (2 Sam. xi.); and so on. So likewise are the moral turpitudes of families, *e.g.*, the sons of Jacob (Gen. xxxvii. 18-28); and the brother and sister of Moses (Numb. xii. 1). So also are those of tribes, *e.g.*, Rheuben and Levi (Numb. xvi.). So are those of nations (Lev. xviii. 18); and even God's chosen people (Numb. xxv. 1); and indeed the entire human race (Gen. vi. 5-6).

These heaven-sent or heaven-devised corrective and preventive reprisals for moral sins and excesses are of various kinds. Very often earthly means and agents are employed to inflict them. Very often they are in the form of bodily or mental disease. Sick rooms and hospital wards, asylums, homes, retreats, penitentiaries, &c., are crying aloud to witness against violated hygiene; Nature squaring her account with neglected moral sanitation and aberrant impulses; even as are prisons for a broken decalogue. God often punishes mankind through Nature for disobedience to His commands. As surely does He say of His sanitary as He does of His spiritual laws, "whatsoever a man sows that shall he also reap" (Gal. vi. 7); and if we neglect how shall we escape (Heb. ii. 3). Sins of omission and those of commission are equally punished. And many a sick man, woman, family, and community finds out when it is too late "that it is a fearful thing to fall into the hands of the living God" (Heb. x. 31), and have to suffer His inexorable laws of health and disease for moral delinquency. The hands of the living God are the laws of Nature; and of these the laws of

hygiene, moral and otherwise, are among the most imperative and important. Sadder still is this law that others may be and often are punished indirectly and secondarily for individual moral transgressions; by the far-reaching laws of heredity. This is especially shewn by the Bible narrative, when it points out how Jehovah hates personal and social immorality by the frequent severity of its punishment. A bastard was not permitted to enter into the congregation of the Lord, *i.e.*, the Tabernacle, even to the tenth generation, *i.e.*, practically for ever (Deut. xxiii. 2). Thus it was then as now: the punishment of our personal social sins may be carried onward to our children and those we most love; making them the living monument to mark our weakness.

To the morality of the Old Testament, now spoken of, that of the New closely corresponds; only the latter is more elevated in its nature, altogether on a higher plane, and simplified by being condensed from ten into two commandments, namely, love to God and love to our fellow creatures. Jesus came not to annul but to endorse the Sinaitic law; to amplify and expand it (Mat. v. 17). What morality can surpass that inculcated in the matchless and perfect sermon on the Mount, so infinitely elevated in tone above that of the old standard Mosaic code and so divine? Verses 9, 28, 22, 34, 38, 44, 48 of Chapter 5; verses 1, 33, of Chapter 6; and verses 1, 5, 12 of Chapter 7, seem especially noteworthy, as having a moral basis and tendency. How different mankind and earth would be were such eminently wise morality practised as well as preached, even in Christian communities. It would evidently be misplaced to study this Biblical morality fully here: and it will suffice to follow our former precedent and merely illustrate it by that variety of moral manifestation which enters so largely into the personal, social, and even public moral, medical, and hygienic life of all countries, communities, and peoples, namely, sexual morality.

The warnings of the later New Testament Scripture against over-indulgence in certain feelings, impulses, and desires, some of which are impure passions, are even more strongly expressed than in the Old Testament. The several appetites and longings of various kinds and grades that give us pleasure; and in which we are therefore apt to indulge freely, it is our duty to curb; because in excess they are baneful alike to body, heart, mind, and soul. The observance of this rule should be not only strict but constant; and ought also to include purity in thought and heart as well as in word and deed (Mat. v. 28). Our duty and interest both lie in fully eradicating these and indeed all of our evil propensities (Mark ix. 43). If we neglect or fail in our effort, disease or some other disaster may sooner or later follow. The New Testament teaching is that in *all* things we should

mortify and subdue our bodies and their evil inclinations (Rom. viii. 13; Col. iii. 5). And that we should thus keep in control not one only, but every propensity, passion, and feeling that has a dangerously evil tendency; especially those special sins that all or nearly all have, and that so easily beset them (Heb. xii. 1). Moreover, we ought thus to check not only the decidedly vicious and dangerous, but even the good ones; seeing that even these are likewise apt to run riot and lead us into extremes. Strict heart culture and control and mind purity are everywhere forcibly inculcated in the New Testament as in the Old. And it is wisely pointed out that the worst kinds of defilement come not from without and from other persons and things, but are self-generated and from within (Mark xvii. 18-23). True, others may corrupt us; but they cannot without our consent (Prov. i. 10); and that we may and ought to withhold. We are less defiled physically by what we eat or touch than we may be, and too often are socially, bodily, morally, and spiritually, by our own thoughts, words, and deeds (Mat. xv. 19). Against unwisdom in these, therefore, we should specially watch, and thus keep ourselves pure in body and soul (1 Tim. v. 22), by mortifying our members (1 Colos. iii. 5); that is by destroying and putting to death all the habits and lusts, great and small, connected with hostility to our Christian discipleship and heavenly destiny. Paul specially warns Timothy, then in the prime of life, when the passions are strongest, to flee youthful lusts, the besetting sin of that age (2 Tim. ii. 22). In accordance with this wise advice we should not only then but at all ages, strenuously abstain from improper inclinations and the desires of our corrupt nature, which war against the soul and its interests, both temporal and eternal (1 Pet. ii. 12; Rom. xiii. 14). The evil longings of our depraved disposition attack our higher powers and faculties, and too often bring judgment, conscience, imagination, and intellect under their baneful and destructive influence. We should avoid, cast off, and flee from even the dangerous beginnings of impurity in thought, word, and deed (Prov. xx. 9), for a still higher motive; because we are not our own but God's (1 Cor. vi. 19); and also bought at the price of Christ's suffering and Crucifixion (1 Cor. vi. 20). We, individually, and our race collectively, are God's handiwork; and hence so sacred are we in a sense and as such, that in effect whoever lays his hand on a human body touches a piece of heaven. The Apostle Paul calls our body the Temple of the Holy Ghost (1 Cor. vi. 19). Nor should we forget that, as free and independent agents, it lies not with our friends or fellow creatures, nor even our Maker, except indirectly, but wholly with ourselves, to keep the shrine pure, and prevent its desecration (1 Cor. vi. 19). If we sin, therefore, we err against our own self, body and

soul, and to our own temporal and eternal detriment (1 Cor. vi. 18-19). Nor can we anywhere find better advice as an aid to maintain or regain our purity than that of David, who counsels frequent self-confession thus, "Commune with your own heart on your bed and be still" (Ps. iv. 4), and the guidance of conscience, the monitor of the unwritten decalogue of the human heart, which not only warns us against but convicts us when guilty of sin. And although it is not unfrequently necessary and excusable for us in our ordinary intercourse with our fellow-creatures to exercise that justifiable modification of self-esteem usually termed self-respect, and keep our head erect and heart strong, no true Christian ought or can do otherwise than walk "humbly" before God (Mic. vi. 8), or harbour the major, more worldly sentiment for a moment in his breast, seeing that we and all we have and are claim their source in, are owned and have been redeemed by supreme and boundless grace, infinite and eternal love.

From a medical standpoint, impurity in thought, word, and deed may, like other vicious habits, be truly considered as originating in a naturally infirm and perhaps diseased nervous system, in which the controlling or inhibitory powers are diminished, and conscience lulled, thereby permitting the individual to act in obedience to the promptings of his own passions and desires, by yielding to which the body itself is exposed to many disorders and diseases. The condition, especially when pronounced, should therefore be treated largely or mainly as a disease, or recognised as the beginnings of such; its results deemed as dangerous, moral and social evils: and the sentiment of purity not merely inculcated by precept and example, but the root of all impurity struck at by impressing, restraining, moral lessons in early life, plain speaking to children regarding the dangers of school life, the resistance of disease-inducing, vicious habits, and prompt punishment of offenders by parents and teachers, not only for the culprit's sake but that of his fellow students; a careful hygiene of the school, its sleeping apartments, and associations; and, lastly, by judicious but firm legislative interference: since it is as unwise to allow this to go on unrestrained as it would be to permit unlimited drunkenness, theft, or murder. It would be difficult to estimate the immense amount of suffering and disease annually entailed both by the votaries and the victims of impurity. It is a mighty evil that must be looked squarely in the face and strongly combated.

The inference to be drawn from what the New Testament says regarding those unwise and vicious feelings, passions, tastes, habits, and impulses that beset us is; that some of them, for example the purely or chiefly mental or emotional ones, such as hatred, malice, envy, &c., should be curbed and not indulged in

at all (Colos. iii. 8); while others of a more physical nature, such as eating, drinking, and similar enjoyments, should only be indulged in to a "lawful" extent and in moderation (1 Cor. ix. 27; Rom. vii. 23; Jas. iv. 1; Colos. iii. 5; Rom. vii. 15-19). If tempted to overstep the bounds of prudence in a matter which involves not only our duty to God, but also our physical health, moral and spiritual welfare; we ought to make the strenuous resistance which all people are capable of successfully offering when they choose to try, seeing that no one is tempted beyond his capability of endurance (1 Cor. x. 13); and will assuredly be divinely aided in every effort at self reform, however feeble the effort (Rom. viii. 26). None are exempt from this constant warfare against sin; and, with one exception, no one has escaped defilement therefrom (Rom. iii. 10-23), or avoided the wounds and downfalls with which even Christians are familiar and have so often and so deeply to regret. Who can put his hand on the decalogue and say he has never transgressed (Ps. cxliii. 2)? In the pure eyes of God no man living shall be justified (Rom. iii. 23). The purer the life and more elevated the character and heavenward aspirations, so much the more sensible does the Christian become of this fact. And, aware of his own weakness and imperfection (Ps. ciii. 13; Jas. v. 11; Heb. iv. 15), so much the more benevolent does he become; so much the more inclined is he, if not to excuse at least to pity, the failings of others, and anxious to help them to amend (Acts xiv. 15; Jas. v. 17). The Biblical antidote and cure for one and all of these moral aberrations is the same; an exceedingly wise and simple one, although often difficult to fully carry out, yet not impossible, as the author we quote Himself testifies, "I keep my body under subjection" (1 Cor. ix. 27). This important hygienic hint applies not only to the body as a whole, but to every organ, part, function, affection, and desire; spiritual, moral, social, mental, and physiological. Humanity ought to curb and control them all when apt to become inordinate.

Nor can mankind escape from these hygienic rules and Biblical commands regarding self-conduct and self-restraint; whether spiritual, moral, mental, or physiological, on the plea of irresponsibility. Man is neither a self-created, nor a self-dependent being; and therefore has no right to impugn his Maker and Owner; or to question the wisdom of our Sustainer's maxims, laws, and the conditions of our existence. We are no more permitted to question or cavil at our physical or psychical structure than we are allowed to object to our planetary abode, our race, sex, social position, or place in the scale of creation. For "shall the thing formed say of him who formed it, why has thou made me thus?" (Rom. ix. 20). Consequently we have no warrant or justification for indulging to excess those appetites, desires, and

inclinations which he has seen fit to implant in us, when told that it is detrimental to do so and wise to control them. Nor, rightly regarded, will these moral restrictions be deemed unnecessarily harsh and restrictive, but rather as highly beneficent and meant for our good. The usual experience of transgressors is, as with David, that they are so, and that perchance it would have been well for them individually had speedier obedience been effected by the agency of earlier affliction (Ps. cxix. 71). Regarded thus, morality is not a blind compliance with dogmas or creeds; nor an unwilling obedience of useless and needless laws; but a hearty subscription and submission to the judicious health commandments of an all-wise Creator.

This subject, individual morality and hygiene, is, moreover, one of far wider import: and involves the question of public, moral, and spiritual health and hygiene. Social impurity and its dangers is no chimera; but a crying evil. It is one of the great sins of the day, as it has all along been, from early Bible times downwards; even in enlightened and civilized countries; nay, even in so-called Christian communities. The professors of Christianity may be divided into three classes, true Christians, indifferent Christians, and pseudo Christians. The latter two, especially the last, undoubtedly form a large percentage of the whole. Among these such lessons as the New Testament and Bible generally give on morality and moral hygiene, are especially required. At the same time, from a practical standpoint, the regulation of the morals of a community, like their religious welfare, must be mainly left as a rule to individual management and judicious education, early and adult. To effect this widespread general knowledge of a high order is necessary, and a healthy public tone, to make these matters a subject of intelligent public conviction among all classes, especially masters, parents, municipal, parliamentary, and other authorities, as well as among the people more immediately concerned. And it is well to remember that while private rectitude is necessary for public virtue; both of these combined are indispensable for public health. And also that all three are requisite for national prosperity. Physical causes of disease are often removable by State enactments; but the social and the moral ones are not so easily controlled. Much preventible disease is attributable to social causes, which legislative measures or ordinary sanitary precautions do not reach. In such cases we must depend mainly on a personal and public sense of duty for redress. Social questions of this kind, in modern as in Bible times, are both numerous and often difficult to grapple with. But they can all be best grappled with on the lines of the comprehensive and incomparably wise morality taught by the Holy Scriptures.

Both the Old and the New Testaments thus contain much

important matter relating to the subjects of private and public morality and hygiene; usually blent more or less with the inseparable theme of soul or spiritual hygiene: for the soul influences the moral mentation, and the morality affects the soul for good or for evil. The decalogue and the two laws into which these were crystallized by Christ are still and will always remain the great moral and spiritual hygienic codes of the world; not only for individuals, but for all nations and all mankind; not for ancient times and the Wilderness only, but for every period, circumstance, condition, and place.

Of all the moral teachers whose maxims are recorded in Holy Scripture, Jesus stands incomparably pre-eminent; because the morality He taught was not only supremely pure and Divine in its nature, but also strictly original, not derived or instilled, but also personally illustrated as to its practicability. But next to Him of the various strictly human agents, patriarchs, priests, prophets, and apostles who have been honoured either by their acts or writings, to carry out the educational lessons and will of the Supreme towards man, the race He had made, and in which, notwithstanding its rebellion and sin, He continues to take such deep interest, in this all-important matter of moral hygiene, a subject which clearly and largely affects our human welfare, both for time and for eternity, as we possess a double entity, one physical and temporal, another spiritual and eternal, and thus belong to the next as well as to this world: Moses "the Man of God," and His "servant," stands pre-eminent, as he does in most other hygienic subjects, and indeed in all matters relating to human conduct. And the special rôle which he played in the practical promotion of this great scheme, makes his life and labour, even as a sanitarian alone, one of the most prominent landmarks in the history of mankind. Inasmuch as his Heaven-born, nay, essentially Jehovistic teachings, were specially honoured and accredited by an august delivery from Sinai, in the hearing of the whole congregation, written by Jehovah's own finger, and given to the Israelites to be by them bequeathed as a legacy for the entire human race. This legacy of laws copied by Moses not only shewed the true source of moral as well as spiritual and physical health, but also indicated how, and how easily these influencing health-keeping factors might be departed from; and how this mishap was to be combated. Jehovah, through Moses, laid down to rule the mode by which morally sin-burdened and disease-stricken man may return to health, happiness, and the favour of God: and by preventive, that is hygienic, means, conquer not only the results of moral sin, but also the sin itself. He pointed out the close connection that exists between the soul, the morals, and the body, both in health and in disease; between the spiritual and moral results

of sin on the former two, and its physical effects on the other: and also between the hygienic care and hygienic prevention of both, through individual obedience or disobedience of the Divine laws. Clearly it is by strictly and in a manner indicative of the true Christian, obeying these moral laws of hygiene, given so fully and plainly and imperatively in the Holy Scriptures, that we may best *prevent* the grievous diseases of body, mind, heart, and soul, that so often result therefrom. And it is by acting in the same fashion that the weak Christian, who has lapsed in morality, or the newly awakened sinner, who has repented and now sees its value, may be *cured* of his moral infirmity, and its results and a repetition thereof prevented. No inferior part of the great mission of Moses, whose writings are so largely quoted in these pages, was to develop, under Divine inspiration, a comprehensive system of combined spiritual, moral, and physical hygiene, to promote the health, vigour, and best interests of the Hebrew souls, minds, hearts, bodies, and homes and communities, those of the nation at large, and through them to teach the world generally: and to initiate, and practice that code and system to prove both its practicability and its efficacy; thereby, by Hebrew teaching and example, and imitation by other nations, mankind at large might recover somewhat of all they had lost by the Fall, and to endeavour to restore the moral as well as the physical and spiritual condition of Edenic times. Towards this consummation, so devoutly to be desired, the development of a high and pure morality among mankind is a most important factor; and as the salt of the earth in philanthropic matters like this, the cultivation of the strictest and purest morality among Christians, both for individual interest and for example's sake, is a vital element.

These Scriptural teachings on moral points have neither been unnecessary nor inopportune. Morality and its pursuit on the one hand, and its aberrations and their results on the other, have been constant and increasing factors in the personal, communal, national, and racial life and history of Man, ever since he appeared on earth. It was neglect of this that led to his downfall; as it is this which, in different phases and degrees, leads to our personal lapses now. Our first parents disobeyed and neglected His moral commands; and we do the same continually. The same great fact is proved by national histories; not only that of God's chosen people, the Hebrews, but by those of other nations. These all shew how important it is to keep the balance between the soul, morals, intellect, and body true, and all of these and their functions clean, after the Bible model and teachings, with a view to avoid or minimize moral catastrophes in individuals, families, communities, and nations. Because secular as well as sacred history attests that, from a

decline in morality and spirituality, arising fundamentally from forgetfulness of God, and secondarily from diseases arising from social causes and lapses of morality, not only persons and tribes, and even nations deteriorate in health, become mentally and physically inferior, become shorter lived, and shew a higher sick and death rate. The downfall of the Greeks, the physiologically and psychologically most highly gifted nation of modern times, was chiefly due to widespread immorality, arising from neglect of these, the natural God-devised hygienic laws of our individual, social, national, and racial being. On the other hand it was not so much, if at all, attention to the leading factors in public hygiene, namely, sewerage, drainage, ventilation, and other measures of public sanitation, for these were more or less unknown in those days, except to the Pentateuch-instructed Hebrews; but to the exercise of personal and social hygiene, and the individual practice of the virtues, especially temperance, chastity, controlled passions, and appetites, healthful exercise, and severe training (virtues from which successful nations are so apt to depart), that caused the rise from obscurity of the Assyrians, Egyptians, Medes, Persians, Romans, and other dominant nations of antiquity, and made them attain physical pre-eminence. And so in turn it was the slow effect of opposite influences which caused these very nations to subsequently deteriorate and decay. The same malific agencies are still at work in the world, and slowly but inevitably exterminating not alone the savage and the semi-civilized races of the present day; but also, as in ancient times, some of the more highly gifted and secularly enlightened ones. The Aborigines of America, Tasmania, New Zealand, Australia, Africa, Asia, and elsewhere are rapidly disappearing from the face of the earth, not from local, physical, unsanitary influences; but from the moral vices introduced by civilized but clearly unchristian people, and the resulting social, mental, and body health deterioration and degradation that invariably spring therefrom, in accordance with and as a result of Divine hygienic laws, clearly laid down in and illustrated by Holy Scripture centuries ago.

The morality which the Holy Scriptures inculcates and enforces; the public value, of which Moses exemplified practically on the Hebrews; and the individual practicability of which Christ exemplified by His life, is thus of the highest order, the best and purest to be found or formulated; as it includes purity of the whole man, soul and body, heart and mind; and aims at cleanness of the inmost and most hidden thoughts, as well as the more patent words and deeds of everyday life, and especially of the sacred and educational home. And, with a practical purpose it speaks oftenest against those aberrant moral tendencies most apt to assail, besoil, and mar both our earthly and our future life.

As to the special *aim* of the hygiene of Holy Scripture in modifying the moral habits and functions, the moral teaching throughout and its illustrative histories and biographies aim at educating mankind, individually and collectively:—

1st. As to the danger of and necessity for controlling certain of our human desires; for example, the animal passions, avarice, ambition, emulation, selfishness, love of society, approbation, action, and even love of knowledge, anger, jealousy, resentment. Not so, however, our love of moral improvement, which is obviously praiseworthy.

2nd. On the other hand, the Holy Scriptures teach that we should foster and promote and cultivate our better and higher moral faculties; such as justice, integrity, care for others' reputation, conduct, character, feelings, opinion, and moral condition; also our compassion and benevolence towards distress, &c.; also our veracity, trustworthiness, and sincerity. Likewise our friendship, love, gratitude, patriotism, domestic affections, and, above all, our responsible moral relation to God.

It also inculcates the cultivation of a just but firm will-power; and a close scrutiny and care of that invaluable moral balance, the conscience; the proper function of which is to enable us to think and to do aright by judging justly between right and wrong thinking, speaking, and acting. The Holy Scriptures indicated centuries ago what our moral conduct towards God, our fellow creatures, and ourselves should be. It covers every point and principle: and its teachings far surpass all the self-devised and earth formulated systems of the wisest moralists and philosophers, either of ancient or modern times. And it indicates and proves that our wisest human aim should be to imitate, and as far as we can strive to equal the morality of the pattern man, Jesus, who strictly kept not only the special ancient moral law or decalogue, but also the entire law of human hygiene, as formulated by Jehovah for the heart, body, mind, and soul of man, in short the entire human entity. For in his heart he suffered no guile to enter, and whose thoughts, words, and deeds, as the inevitable outcome, were therefore faultless (Rev. xiv. 5), not only in the eyes of just human opinion, but before the infinitely more critical and searching tribunal of Heaven.

From a medical point of view, the broad design of the entire Biblical moral hygiene is to give humanity a system of sanitation, which is at the same time simple, applicable, universal, beneficent, and of a double nature, namely:—

1st. Health-preserving, sanitary, preventive, prophylactic, and calculated.

a To prevent moral disaster and disease in the young, simple, and unsophisticated.

b To help the weak-kneed, sinful, but repentent culprit from again foolishly transgressing.

c To shew these that self-help is one of the greatest and indeed essential elements of success in the preservation and invigorating the moral health. Jehovah helps those who help themselves.

d To shew them where and how the best of all aid and support, namely, the Divine, *is* to be found, *how* it is to be obtained, and that it is to be had freely and *fully*.

e To shew we must still in modern as in Bible times obey the decalogue and all God's commands, as the Israelites did or ought to have done, if we would succeed in attaining a satisfactory morality.

2nd. Or it may be curative, sanatory, healing, or health restoring, and meant to re-build the errant, moral culprit by shewing him:—

a The folly and guilt of moral transgression.

b To teach him how he may be restored to moral vigour by,

c Self-help, the initial and imperative necessity; and a sincere desire to amend and resolution to sin no more.

d To lead him to sincere sorrow for his sins, repentance, and a firm desire to amend.

e To shew he must ask forgiveness from the Divine being most offended, namely, his Maker, Owner, Saviour, and God.

f To make him strenuously endeavour, by combined self-help and God's aid, to "overcome" sin in the future, especially his besetting ones.

The sum total of the modes which the Holy Scriptures inculcates for effecting these two great divisions of moral hygiene, the preventive and the curative, by presenting and continuing a judicious, moral environment and satisfactory moral surroundings; is more or less akin to that which modern philosophers, moralists, and theologians now teach, after centuries of elaboration and evolution of thought. These embrace:—

1st. A close walk with God (Gen. v. 22).

2nd. Careful home education and example in youth and childhood.

3rd. Judicious school training and teaching.

4th. Careful choice of friends and companions.

5th. Wisely selected literature.

6th. Strict attention to Jehovah's laws, especially the moral

and hygienic ones, as given in God's moral health manual, the Holy Scriptures (2 Tim. iii. 16).

7th. Frequent prayer for God's aid and protection from moral evil.

8th. Constant individual supervision and scrutiny of our moral motives (Mark xiii. 37).

9th. A constant watch over the soul's welfare as one of our moral monitors.

10th. Perpetual scrutiny of the conscience.

11th. A full acceptance of and reliance in God's full forgiveness of transgression and forgetfulness of it through the merits of Christ's atonement for general and individual moral sin.

12th. But Biblical differs from secular morality in shewing that the most complete, strict, and perfect morality, though highly commendable, and right, wise, just, and good, is of itself of no avail to save any sinner; inasmuch as we are "saved by grace," grace alone (Eph. ii. 5), and by the merits and atoning sacrifice of Christ.

The environment and conditions and the hygienic factors necessary to ensure the highest human morality, such as best suits our interests, both for time and for eternity; factors which Jehovah therefore inculcates, advises, and enjoins on all who profess to love, serve, and obey Him; are very ample, minute, searching and apposite. And, moreover, they are repeated in the Holy Scriptures in every possible shape and form; so as to impress them, shew their importance, as the result and best test of our pursuit of the higher hygiene—that is the spiritual. It would evidently be impossible to enter so fully into this subject as its importance demands; or go beyond what has already been said. But clearly everyone of these scattered moral commands of God are as binding on us as the codified decalogue of the Pentateuch.

As a whole the morality of the Old and New Testaments, that of Jehovah and that of Jesus, endorses and emphasizes the enlightened secular morality of the present day; so far above that of Bible times, because improved by education and especially by Christian enlightenment; but still even with that teaching, so far short in practice from what it ought to be in so termed Christian lands. And it infinitely surpasses the low, moral standard evident among rude, untaught, unenlightened polytheistic and heathen nations of savagedom and semi-barbarism.

The hygienic teachings of the Holy Scriptures regarding moral matters is therefore of priceless value; being pre-

eminently practical, efficacious, beneficent, and infinitely superior to any that man has yet or ever can devise. It points out the best surroundings for our moral harmony and health; those which aid the continuance and improvement of that salubrity; and also those which militate against, tend to diminish, or destroy this; thereby ruin us and our entire nature, soul, body, mind, heart, and social life, and thus mar both our temporal and our eternal interests. The moral hygiene of the Holy Scriptures endorses that of secular growth; but far surpasses it in elevation, depth, comprehensiveness, priority, and wisdom; for it is that of Jehovah Himself, the essence of His own morality, the reflection of His own moral mentation; and is therefore as "perfect" as all else He has created, and so like it "very good" (Gen. i. 31).

CHAPTER XIV

SPIRITUAL AND SOUL HYGIENE.

"Keep thy soul diligently" (Deut. iv. 9; 3 John ii.; Ps. xcvii. 10; xxii. 29; li. 10).

Continuing to ascend the hygienic scale we reach a still higher level than either mental or moral sanitation; and come to the highest and most important of all, namely spiritual or soul hygiene. This, however, need only be briefly studied here. It lies more in the domain of the Divine than in that of the physician to investigate the soul, its sins, that is its diseases; the hygienic influences and methods by which these aberrations are best opposed and remedied; and the best soul environment for mankind, individually and collectively. And therefore it is only briefly taken up here, because it not only forms, as the Holy Scriptures shew, an integral part of the hygiene of humanity at large, but by far its most important part; is therefore necessary to complete the scheme of human sanitation; and is moreover, closely commingled with and correlated to all of the other departments of human hygiene already studied, namely, the moral, mental, and physical, with which physicians have so largely to deal. Divines and doctors both realize this; know how often their professional duties touch; and how materially both may aid each other in this department of health-preservation and restoration while working for the good of the ailing, and doing the work of their mutual Divine Master.

Even in these modern days, notwithstanding the enterprise and enlightenment of certain leading Christian nations and sects, the Holy Scriptures are known or at least studied by comparatively few; and of these few who do read them, how occasional this perusal often is, and how many soon forget or ignore their contents. Hence it is why so many facts of great importance to humanity are neglected: and among these none more so than the knowledge of man's true entity, what life really is, and what this world in which we live.

The *Earth* and *Nature* do not consist of matter evolved into numerous forms, swayed by a multiplicity of re-acting and in-

herent forces and laws, all working by chance: but everywhere give evidence of having been, as the Bible has all along informed us, slowly evolved by a mighty supreme intelligence, architectural master-mind, and ruling Creator, acting on definite lines, for special Divinely beneficent purposes; and in the case of Earth to fit it for the abode of a new and special creation, Man; a new creative departure of superior mould, in which Jehovah took especial pleasure and care (Gen. i. 26; xxvii. 9, 6), of whom He expected great results, especially fealty, love, adoration, and obedience. *Man*, though the copestone of our animal world, as the Bible alone informs us, is not a mere high-class brute, evolved and preserved solely by forces and laws inherent in the matter of which he is made and the chemical elements that combine to form this; but owns a Creator and Sustainer, namely Jehovah. Nor does *Man* consist only of a visible, physical, and perishable body, having this globe as a temporary but sole abode. He consists of something far more important, and possesses an immaterial, unseen, intangible, spiritual, and immortal entity called a soul, of infinite value, enshrined in and mysteriously blent with the mortal body, which moreover it dominates through life and quits at death; is in reality the true being and person, the real ego; that only temporarily inhabits the body; is that part of Man which is most valued by God (Mat. xvi. 26; Mark viii. 20), and therefore that which ought to be most carefully cherished and tended by us. Man has thus a double nature, a psychical and a physical, and belongs to two worlds, the body to the present and the material; the soul to the future and the spiritual; and is now a denizen of Earth, but an heir to immortality (1 Cor. xv. 53; 2 Tim. i. 10). On the other hand, our human *life*, begun at birth, is not merely temporary and earthly but eternal. Only the earthly body perishes at death. The real being, the soul or ego, lives on. The earth, life, or probation of the soul is given for its education for God's service here and hereafter; with God's book, the Bible, as an instructor; Jehovah to aid; and our own education in holiness to complete; each soul having to work out its own salvation (Phil. ii. 12).

Christians are privileged in not being left in ignorance on these vitally important points, and in being Divinely taught that of whch others not so fortunate have merely a dim but unverfied innate instinct; and having these all engrossing matters divulged to them by the best of all informants and authorities. This revealed knowledge is the joy, hope, and anchor of believers. They derive this information from the Holy Scriptures alone. Those not so fortunate, possess no such vital truths, enjoy no such comfort, have no similar pleasing outlook.

The Holy Scriptures inform us that our *Earth life* is merely

a brief episode in an undying existence; but a most important one that embraces vital issues, according to the wise or foolish methods we individually or collectively pursue. *Man*, truly viewed is really an invisible divine and immortal soul, temporarily pent in a physical body; a "living soul" embodied and housed in a highly complex vitalized machine or frame, until its earthly career and education are complete. A soul made and owned by God; given Man to keep, develop, and train for Jehovah's service; a gift and a duty for which we shall be held responsible. The world is merely a transient home and school for the mysteriously blent soul and body, to develop, test, train, and fit the former for a higher, purer, holier, sinless existence, with a renewed semblance to and a closer communion with his immaculate Maker.

The importance of these facts and this Biblically imparted knowledge will be made all the more evident by contrast. Thus reflection will make it sufficiently evident how different Earth would appear were it otherwise than as the Holy Scriptures affirm; and this orb were our sole as well as our temporary abode. It would be practically a physical, mental, moral, and spiritual pandemonium or hell if there were or even if we believed there were no God. Earth would be a field from which to extract the highest and greatest amount of gratification in the shortest time. Again, how differently Man would feel, think, act, and speak if he consisted merely of a temporary perishable body, and had no animating and controlling soul. He would live on a level very much akin to that of the brutes that perish (Ps. xlix. 12); his body would be his sole care; life would be bounded by the horizon of death; carnal instincts, pursuits, and pleasure would predominate as his highest aim; self-gratification would rule his life; sin and Satan sway; our nearest would be merely passing friends, to be utilized for our purposes. Evil would be everywhere rampant, and Earth even worse than before the flood, when "Man was *only* evil, and that *continually*" (Gen. vi. 5). Again, how different life would be and how differently conducted if there were no God, if we had no soul, no future, no day of reckoning looming in the future, no Christ, no Bible, no love; no supervision of human destiny and control of rebel Man by the immutable laws of the All-wise. Man's aims and aspirations would be of a very different and far lower type if we believed we had no prospect before us but to pass through the relentless mill of conscious existence, and then perish; and if we had no higher and better nature than a fragile perishable body. Satan would constantly and successfully tempt; sin ever drag us lower; evil would be neither hated nor fought, but loved, courted, and followed. Living each as we pleased we should be utterly indifferent to sinful ways,

thoughts, and deeds; seeing no necessity for striving to be pure, upright, or Godly. All unaware of the existence of a soul we should neither know nor feel the necessity for soul hygiene, or even for a spiritual health-environment for the body; wholly unaware that there is indeed a loving and beneficent God to please and obey, a judgment bar at which we shall be tried for our earthly conduct; an invaluable soul or spirit to tend and save from sin and death, because of infinite value in its Maker's sight (Lam. iii. 25); a future of happiness to gain or one of misery to avoid as we deserve. Had such conditions prevailed what a world this would have been to inhabit; what a race amongst whom to dwell. How supremely unfortunate mankind would have been; and what a miserable, hopeless life this would have been to lead.

It was to meet and promote the higher real conditions of human existence and the infinitely more elevated plane of life that should prevail that it pleased Jehovah to make and bequeath hygienic forces and laws, evolved by Himself for our special human welfare. Moreover, with His usual forethought and beneficence, He did not leave us to find these laws of spiritual health out, after long and sad personal experience, built on repeated disasters and mistakes; and all the more difficult to discover from belonging to a domain, the spiritual in which we only partially live, only partly belong to, and of which we as yet know but little This hygienic system necessarily included a spiritual hygiene for the care of the valuable soul, an entity of vast importance and yet inferior to that which the human soul would have required had it retained its pristine Edenic purity and holiness. Man and the world-home made for him are not now what they then were ere Man marred this double entity, damaged his prospects, and spoilt his earthly paradise. But still this condition might be worse: and that they may still continue with Divine aid to improve all men earnestly hope. Fortunately, Man was not left unaided to think this spiritual-hygienic problem out; as he might never have accomplished it. We could never have found out for ourselves that we really possessed a soul: nor could we have discovered the laws best adapted for its health and hygiene, far less codified them, as Jehovah has done. These were accordingly revealed by our Maker in and as part of the broader and more comprehensive hygienic law for the entire Man; and made the most important part of that law; for it was constructed for the real ego and true Man, the soul; whereas the physical, mental, and even the moral hygiene that complete the hygienic law of the Holy Scriptures were for Man's vital but still less important parts and nature, his body and his mind and social life. These views clearly verify, enlarge, and put in a new light the truth of the poetical crystal,

"the noblest study of mankind is Man"; and elevates the plane of that idea to the study of the real and permanent being, the human soul and its environment.

This information regarding the sanitation of the human soul; like that concerning Man in his entirety, life, the world in which he lives, and creation of which he forms part, we glean and can glean only from the Holy Scriptures. Christians base this, like the rest of their belief, not on fancy but on facts. And those facts, to be presently adduced, form the basis and groundwork of all spiritual sanitation; and constitute this branch of hygiene, the copestone of the human system of health medicine; one subject of a system inaugurated not in a crude but in a developed form, centuries before humanity, whom it was designed to benefit, thought of it. And hence, holding such views and animated by such hopes, the aims of those who believe in the existence of God and in the truth of His Bible, are high; because they are not bounded by the narrow horizon of our brief earthly lot. Their motives are lofty, because animated and drawn from another source than the harsh experience of this world. Their conduct is laid after an exalted standard and based on pleasing Jehovah and tending carefully the infinitely precious soul He has entrusted to their charge; and the situation which life presents is cheerfully accepted, because they realize that there is something in this world besides matter and the appertaining sciences and philosophies; and something else in the future than annihilation. Besides all this there is a still more important, doubtless vaster, and unseen spirit-world to which we also belong; a world that has its controlling forces and laws, owning the same Creator and Controller, the All-wisdom. Man has a soul as well as a mind and a body to care for; a spiritual as well as a physical entity, with the welfare of which that of its frail temporary habitation sinks into utter insignificance.

This soul of ours, which is our true self, although we cannot see, touch, or realize its existence by our present gross physical senses, nevertheless exists as a special and distinct entity that we, though we do not now, shall doubtless one day behold, when our present orbs of earthly vision have superadded to them the spiritual sight of another world. This psychical entity, the soul, even pent as it now is, has, like the body which enshrines it, its life, health, sicknesses, mission, duty, and its death. It also possesses its attributes, functions, its good and evil tendencies. So also the soul has its hygiene and its conditions or environment, which tend to preserve or restore its health; as well as other morbific factors, which may diminish or destroy this. The Holy Scriptures likewise inform us regarding what we could find nowhere else; that the health or sickness and the welfare of the soul are of infinitely greater import than those of the

body, great as those are; and so require to be studied and looked after. It follows that soul hygiene ought to be studied and pursued more assiduously both by private individuals, for personal reasons, and by doctors and Divines for professional ones, than corporeal sanitation.

Man thus belongs to both of the two great worlds of Nature, the spiritual and the physical. These two worlds, that of matter and spirit, each has its special controlling forces and laws. And as the two very different and distinct forms of entity are sometimes commingled, even in this world, as in Man, it follows that the laws which govern both must be commingled and correlated. The natural laws which govern our corporeal being must cooperate with the natural laws of our spiritual entity. Law reigns in Man as it does throughout Nature. In him we find several kinds of natural law. For example, he is material, and therefore amenable, to physical laws; he is living and therefore under the sway of vital, physiological, or biological laws; he has a soul and is thus governed by spiritual laws; all three kinds of law being interdependent in him and correlated. The spiritual world has unquestionably laws of its own, with most of which we are yet in this crude, earthly state of existence entirely ignorant. But some of its laws are undoubtedly such as now prevail, and are now known to us as existent in the other worlds of Nature better known to us, especially the physical and the vital. Nevertheless we have to study these spiritual laws, however indefinitely and uncertainly, as our spiritual or soul hygiene and environment are incorporated therewith. In this study the Holy Scriptures intentionally materially aids us; and gives the enquirer as much of the Divine "light" as is beneficial and necessary for us now. And that is considerable in amount.

For hygienic study Man may therefore be regarded as consisting of a soul, a mind, and a body; each of which has its health, its diseases, its death, its suitable hygiene and sanitary environment. Moreover, as these three are intimately associated, correlated, interdependent, and inter-reactionary, so likewise are their health, their diseases, and the different factors that form their hygienic environment. And the importance of the fact makes it worth repetition that while every one of the many factors herein spoken of as combining to form the proper and best environment, healthy surroundings, and wisest hygiene for humanity; is of very great importance and value to humanity, as they affect for good or for evil that which is of such infinite value to all individually, namely their temporary dwelling, the physical body: yet the spiritual or soul hygiene and its factors far surpasses them all in importance as a personal study and for its practical outcome; as it deals with the interests, health, happiness, and welfare of the real person and ego, our permanent

and immortal entity; for the soul and not the body is the real Man (Lev. v. 1-2). And it is well for us that, notwithstanding our racial and individual rebellion, ingratitude, sin, and forgetfulness of our Maker and Benefactor; God's chief attributes are undying love and beneficence; that He desires to have His world and His human race re-educated up to their former position in His likeness; and, again, made holy, pure, and clean, like Himself. And in His Holy Scriptures has accordingly revealed, in order to teach us, the elements of hygiene, not for the body only but for the whole Man; but particularly for that department which we could never fathom or find out for ourselves, namely, our permanent entity, the soul.

Of our true self, the soul, the real man or woman, we know comparatively little. That little we glean mainly from the Holy Scriptures. But of much that we fain would know we are, doubtless wisely, kept in ignorance. And, as with many other departments of knowledge, what we do not know far exceeds what we do know. But for the Holy Scriptures we should be as mystified regarding even that little as was Plato and Socrates. Indeed, there are few things about which we know less than about our true entity. What we do know may be thus summed up:—

1. God has not left us to find out everything about the soul, even its reality, as He has about so much else in Creation. No other book but His special volume, the Bible, tells us about the spiritual world, and the human soul, its source, and Maker, its subjection to spiritual laws, its connection and co-operation with the material world, and the consequent co-relation of the spiritual and physical forces and laws of Nature on Earth and in the human frame. But for this guide book in spiritual matters as they affect humanity we should be still, and probably would for ever remain in doubt regarding the soul, its affairs, and relation to ourselves and to God.
2. It is spiritual, intangible to us, and to our physical eyes, ears, and senses. We cannot see, hear, touch or handle it, as long as our earth-life lasts; and possibly not till our spiritual eyes and new given sight first open in eternity. Not till we are permitted to see God and our Saviour shall we be allowed to look on our own real self and the souls of our friends with whom in the body we held sweet converse. Science has marked out and differentiated the different great divisions of Nature and shewn that it consists, *first*, of the mineral kingdom or inert matter from the many different ingredients and materials of which by the

disintegrating and reconstructing influence of germ and root and leaf and sap are evolved; *second*, the vegetable kingdom, in infinite variety of species and genera and far more complex organisms. From the disintegration and reconstruction of these again by digestion and assimilation is evolved; *third*, the still higher animal kingdom, which, like the vegetable, consists of an ascending scale of more and more complex living structures, capped by the most elaborate of all, Man. So also science has pointed out that Nature, God's handiwork, is controlled by certain forces. These consist of *molecular* forces, which control the mineral world or world of matter; *vital* forces, which govern the animal and vegetable worlds; and *spiritual* forces which dominate the spiritual or unseen world. Moreover, science points out that these God-designed forces are governed by certain God-created, God-formulated laws. But, while secular science has pointed out and investigated pretty fully many of the laws of the material and the vital worlds, including those of the animal and vegetable kingdoms, it can go no further. And here again, where Man stops, the Holy Scriptures, and these alone step in to supply the required information, and give much knowledge, all perhaps that it is necessary or good for us to know at present, regarding the spiritual world, its forces, and its laws. In that special part of Nature and microcosm, Man, whom God has seen fit to honour and select for special ends; we find the most of these laws mysteriously blent; thus his soul is under the sway of spiritual laws; his heart under moral and social ones; his mind under intellectual; his body under physiological and physical ones; all of these being dominated by the laws of vitality. Of these the spiritual are by far the most important; as those which govern the true being. The others are merely necessary for his temporary dwelling and organ, the body. But here secular science stops, and can go no further. And we have to turn to the Holy Scriptures for further information. There and there alone we learn about the more complex and mysterious spiritual kingdom of Nature and Nature's God; and about the Kingdom of God: occupying a still higher plane. This teaches us also that Man forms part of that kingdom, consisting as he does of an immortal part or soul of which his body is the instrument, and home in which it dwells and holds intercourse with the

material world. There we also learn that Man's present condition and communion of soul and body is a temporary one, the first or material stage towards the second, different, and immortal condition, which begins when the present or earthly body dies.

3. The soul was created by, comes from, and belongs to God (Eccles xii. 7); who deems it of such infinite value that although humanity has and still continues to rebel and sin deeply, He sent His only begotten Son to die as a sacrificial atonement and propitiation for soul guilt, and thus saved the human race from disaster and eternal punishment. The Holy Scriptures, and these alone, inform us regarding the origin of human life, corporeal and spiritual. He who evolved Man, the masterpiece of our earth-creation out of the formative intellect, created and inducted the immortal soul in the mortal body. Jehovah alone can initiate vitality, make vital forces and laws, both biological and spiritual; and manipulate them at His good pleasure; and also instil the faculty and function of continuous propagation, which so prominently characterises it. The human race was thus originated not by forces and laws inherent in matter, but by the supreme, formative and controlling mind; God, who created all things. This includes the "living soul" of Man, which was likewise created, implanted, and mysteriously blent with its temporary dwelling and organ, the body; not by forces and laws inherent in the spiritual world, but by those made and formulated by Jehovah, the All-creator and Controller.

4. The bodies of all human beings die; but not so their souls. At death each goes back to its own realm of Nature, earth to earth, ashes to ashes, dust to dust, spirit or soul to the spirit world: "the dust shall return to the earth as it was; and the spirit shall return to God, who gave it" (Eccles. xii. 7), owns it, and who desires to have it return, pure and holy and amenable to Him. Like the human parent, so the Divine craves for the love of His offspring; grieves when it is refused, rejoices when it is reciprocated. Love is the most important of the instincts and faculties implanted in the human breast by the Almighty for us to cherish and cultivate and lavish on him. One of the greatest privileges of science and philosophy is to aid religion; to help the seeker after God and religious truth; and thereby promote this return of the human soul to its heavenly fealty; to send it back to God as spiritually-

minded as possible; to return it "unspotted" after the inevitable soiling incident to the battle of life and the unavoidable warfare against sin and Satan. And hence one of the chief tuitional purposes of the Holy Scriptures, specially bequeathed by God with a definite, beneficent, soul-loving purpose, is to teach Man, that is the human soul and heart, the purest, best, and most elevating morality and spirituality; and to point out the evil and the good which prevail, the former alluring him to indulge, and the latter, to which God points, and advises and aids to follow. This best and most incomparable of handbooks teaches Man the highest and purest moral and spiritual philosophy and tuition: and was bequeathed mainly for that purpose.

5. Although we cannot, God can not only see but read and even forestall its every thought and the aspirations and desires lurking in its inmost recesses (Heb. iv. 12).
6. Jehovah created souls for His glory (1 Cor. xi. 7); longs for their worship (Deut. xi. 13) and heartfelt service far more than for those of the intellect (2 Chron. xv. 12), or for body sacrifice (Is. i. 11).
7. Like the body, so the soul became degraded and demoralized at and by the fall, and subject to sin instilled by Satan, the fallen spirit, who accomplished the disaster.
8. Sin may be described as the soul thinking, saying, or doing things displeasing to God through and by the agency of the body; and inconsistent with its allegiance, duty, and heavenly interests. God has not left us in doubt or left us any loophole by which we may plead ignorance as to what these sins are; but has bequeathed a full knowledge of them in His Biblical handbook.
9. God will help us to fight and abjure sin; but that only on two conditions; viz., if we ourselves try to "overcome" (1 John v. 4) it; and if we ask Him to do so, and as He desires (John xvi. 24).
10. While our soul's best friend is God (Ps. lxxxvi. 2); its most relentless, subtle, constant, ever-present, and persistent enemy is Satan, Jehovah's chief foe, bent on lessening or destroying our allegiance to our Maker, Preserver and Saviour, Guide and Pattern; anxious to induce us to sin, both to annoy God, and to mar His Divine plans for us.
11. The soul is not only of infinite value to God as His property; but also the most important part of every human being to the being himself; and is indeed the

individual, the true ego, the real oneself. Nor does the fact that souls are sinful entities lessen their value or interest in God's sight; and this fact only increases the care we ought to take of them and their value to us.

12. It is not the destructible body which sheds the soul at death; but rather the indestructible soul or true person which sheds its effete temporary earthly dwelling. After death the immortal soul has a new and immortal body (1 Cor. xv. 54): adapted for new conditions and a more refined environment.

13. The earthly body is thus only the temporary abode of the soul; and organ by which and by its many different and specially constructed parts and functions, the soul holds intercourse with the world, its fellow creatures, and Creator; and thus receives its earthly education, and fulfils its destiny here.

14. The soul or true individual therefore has the rest of the human entity largely under its control and management, including the mind, heart, and morals, either for good or for evil.

15. The soul is amenable to and may be swayed either by good agencies, for our benefit; or by evil ones, for our detriment.

16. While Man is the copestone of the plan; the capital of the pillar of evolution of the living entities of Earth; the apex of the pyramid of mundane life; the capital of Man himself and his many different organs and parts is the soul.

17. The soul, that is we, are, so to speak, lent by God to ourselves; as a gift or talent (Mat. xxv. 23), to tend, educate, evolve, improve, develop in heavenly wisdom and stature (Ephes. iv. 13); a privilege and duty for the wise performance of which, after the Divine method, we shall be called to account (Eccles. xi. 9).

18. That since the Fall, and by that event, the soul is subject by heredity as well as by individual disposition to sin; our chief duty to the God against whom we sinned, and our highest interest towards ourselves, is to strive hard to overcome this innate and inherited wickedness, make our souls what God would have them to be, and live as He desires we should

19. This warfare carried on in our hearts, minds, and bodies, between the soul on the one hand and sin and Satan on the other, can only be satisfactorily accomplished by our keeping a constant watch and control over our thoughts; guard on our tongue; and check

upon our actions; and by exercising the utmost circumspection over all that we think, say, or do. Thus only may the earliest incipient developments of sin in thought and its later secondary evolution in evil words or deeds be crushed easily, and Satan's pseudo-friendly machinations against God and us be thwarted.

20. Like other parts of the human entity, the mind, morals, and the body, so this the supervisor and master of all, the soul has also its life (Gen. xii. 13); its health (3 John ii.); and its strength (Ps. clxxxiii. 8); its diseases (Ps. cvii. 26); its death (Jas. v. 20); its hygienic environment and its hygiene (Jer. xv. 19). Moreover, these different parts of human hygiene are all closely intertwined, mutually helpful, and correlated.

21. The soul has *life*, like the body; in correspondence with our dual nature. But the spirit or soul life (Prov. iii. 22), instilled by God to make Man a "living soul," is different from the physiological life instilled to make him a living body. Life, animal or vegetable, the marvellous principles which vitalize the two kingdoms of Nature, are in themselves mysterious. The former is by far the higher development and manifestation. We only know their chief characteristics, accompaniments and phenomena. We know its chief characteristics in both worlds of earth life are assimilation, growth, reproduction, and waste. But life itself of either kind we cannot isolate or analyze as we can a physical compound. They are both something not yet satisfactorily solved. We see, however, that they are not the effect of organization, but its cause. Soul life is still more mysterious. It is the vital principle which animates the human soul; something therefore, like the soul itself, of Divine origin and supremely sacred. From its presence in the soul we conclude that this, the real being, must have its structure and be organized, though not perhaps in physical and physiological fashion, and that it has vital processes; but of the nature of that organization and those functions we know little, and need not speculate. "All life is not the same life. There is one kind of life of men; another life of beasts, another of fishes, and another of birds" (1 Cor. xv. 39). Man crowns the animal and vegetable creations by having two kinds of life; the most highly organized of all biological life and another still higher, which all else in our earthly creation lacks, the spiritual life or life of the

soul. Another form of life, first and alone pointed out by the Bible, but realized by all true Christians is Christ-life (Gal. ii. 20); the new life which makes the dormant soul-life awake and develop activity, when Christ enters his soul, initiates development until His likeness is formed therein, to be built up until he attains the full stature and vigour of a Man in Christ (Ephes. iv. 13). "He that hath the son hath life; and he that hath not the Son of God hath not life" (John iii. 36). We may thus have an active physical life; with a hybernant soul-life, until God in His own good time and in His own fashion instils the new Christ life (Ps. civ. 30).

22. Like all else having life, and like the body which it inhabits, the soul has its genesis, its beginning, its birth, and its birthday. Only, unlike the body which has one, the soul has two birthdays. The first co-exists with that of the body. When the infant germ begins its career, the "living soul" also commences its primary, dormant, or hybernant condition, and, still untouched by the Holy Spirit, starts its earthly life, and strange partnership. And the second far more important birthday, when by God's grace it enters on its new holier career and Christian life; and is "born again" (John iii. 7). The earth life of the soul has thus two stages. In the first stage it is a carnal soul, but spiritually dead, not alive spiritually: in the second stage it is spiritually alive and carnally dead (Rom. viii. 6); and an altogether "new creature" (2 Cor. v. 17). This is Christ's law for the Christian biology of the spiritual kingdom; "that which is flesh is flesh; and that which is spirit is spirit" (John iii. 6). In Man they are mysteriously blent. The life and actions of the body are swayed by the soul. We have the "old man" with his carnal ways; and the "new man" with his Christian ones (Ephes. iv. 24). No matter what our earthly age may be, the soul must be "born again" (1 Pet. i. 23) to become a Christian; a disciple of Christ, a servant and follower of Jesus; the most exalted and blessed of all earthly promotions. On being thus born again we start our Christian career as "babes in Christ" (1 Cor. iii. 1); to be fed and nourished and grow in grace by the "milk of the word" (1 Pet. ii. 2); until at last, growing by assimilation of this heavenly food (Acts xiv. 17), we attain the stature of a "perfect man in Christ" (Colos. i. 28). For when born again, the soul, that is we, are born into

Christ and our lives are incorporated with His life. "When that which is our life shall appear" (Colos. iii. 4) we shall then be one in Him (John xvii. 11). Our soul evolution will be complete. We shall all be one in Jesus (John xvii. 11). Christ is thus meant to be the end and goal of our individual and racial soul evolution and development of our second earthly soul birth, if we wisely permit and aid the process. We in Jesus (John xvii. 21), and Jesus in God (John xvii. 21); and all shall be one (John xxi. 22); will be the great consummation; and the completion of Christ's Kingdom. Thus our twin earthly physiological and spiritual lives, though combined, are different and distinct; run a different course; are swayed by different forces and different laws; one earthly, the other spiritual. Man thus differs from all other living things in being a twice-born organism. Of this great fact no other volume could inform us, but the Holy Scriptures. All other things are born of the flesh only; Man alone of that and of the spirit. Although the crown and masterpiece of this world, and in complexity of organisation far above the highest animals, Man's body is not exempt from all the laws of Nature, physical and vital. Neither is his higher nature or soul free from the laws of the spirit world. If we trace our evolution from beginning to end we find that we come from, *a*, the inorganic kingdom, mother earth (Gen. ii. 7), the kingdom of matter, and material world governed by physical forces and laws. From that Nature evolves *b*, the organic kingdom by utilizing its material with the aid of vital forces and laws, thus evolving the world of life or vital world, consisting of plants generated out of minerals; and animals out of plants. These two form the lower, inferior, or earthly evolution. From this, again, comes the higher evolution of *c*, the spiritual world superadded to the organic kingdom; possessing different forces and laws; and forming the copestone of the law of evolution or development of higher from lower forms; the apex of which is, as above indicated, Christ; and its end oneness and assimilation with or likeness to God (1 John iii. 2), as at the beginning or birth of the race (Gen. i. 26). These facts the Holy Scriptures alone disclose. Thus Man's physical and his spiritual birth are not to be confounded; but may be widely different; nor may the second ever occur. The body life begins with the

germ; its birth when the child leaves the mother. The spirit birth occurs only when the Holy Spirit awakes the soul. Body birth is of the body physical and vital; the other of the soul and spiritual. The one involves the entrance and awakening to world life, and an earthly environment: the other to the higher and holier spiritual existence and a spiritual environment. It will thus be evident that an octogenarian may not be eighty years old spiritually; but perchance only a few years, months, weeks, or even days; a mere babe in Christ; lately or newly born. Whereas a mere youth may be much older spiritually than he; and even spiritually mature. Others again may end a physiologically lengthy life; without being "born again" spiritually (John i. 13); thus dying unregenerate in their sins (Ez. xviii. 26). Moreover, our spiritual growth in grace (2 Pet. iii. 18) may be slow; in others rapid; and thus different from our physical life. Nor has this rate of spiritual growth any relation to our bodily size, our physical strength, or mental capacity; but to God's grace and our individual spiritual proclivity. Jehovah may reveal to the young and the ignorant (Mat. xi. 25) those secrets of life in and for and with Christ, which it would be well if many of the aged, the learned, and the great might know.

23. Like all else that has life the human soul has or should have *health* and strength. The soul not yet re-born lacks both; and is imperfect and incomplete (Acts xx. 35); lives a bad or a vegetative, inactive, aimless life. The Holy Scriptures pointedly and tuitionally give the signs of a healthy soul for hygienic purposes. Thus we love the Lord with all our soul (Josh. xxii. 5; 1 Kings ii. 4; Mark xii. 33); keep His commandments (2 Kings xxiii. 3); set it to seek the Lord (1 Chron. xxii. 19); it dwells at ease (Ps. xxv. 13); we lift it up to Him (Ps. xxv. 1; lxxxvi. 4); it is joyful in the Lord (Ps. xxxv. 9); waiteth upon God (Ps. lxii. 1-5; xxxiii. 20); followeth hard after God (Ps. lxiii. 8); longeth for the Lord (Ps. lxxxiv. 2); blesses the Lord (Ps. ciii. 1); is joyful in the Lord (Is. lxi. 10); we love the Lord with it all (Mat. xxii. 37); serve Him with it all (Deut. x. 12); seek Him with it all (Deut. iv. 29); our souls are at rest (Jer. vi. 16); and prosperous (3 John ii.). On the other hand the soul may be unhealthy; and lean (Ps. cvi. 15); or lustful (1 Pet. ii. 11); or sinful requiring healing (Ps. xli. 4). So also

the soul shews various degrees of strength and vigour, or weakness. Thus it may be weary (Job x. 1); or bowed down (Ps. lvii. 6); troubled (John xii. 27); bitter (Job xxi. 25); or dried away (Numb. xi. 26); or abominable (Lev. xx. 25); negligent of comfort (Ps. lxxvii. 2); or in danger (Ps. lxix. 1). On the other hand it may be strong (Ps. cxxxviii. 3; 1 Cor. iv. 10; Heb. xi. 34; Deut. xi. 8; Dan. xi. 32; Ephes. vi. 10; 2 Tim. ii. 1); and also strengthened (Ps. cxxxviii. 3); and purified (1 Pet. i. 22); and restored (Ps. xxiii. 3).

24. As the soul, this world's chief denizen, is a living entity, it necessarily has its special healthy organization and structure, its organs and functions, its soul-psychology, or science of its properties, its vital forces, their laws, and phenomena characteristic of healthy life, and the just performance of those forces, laws, and functions. These psychological manifestations may remain in our inner consciousness; or be openly and materially expressed through the soul's physical organs, the heart, brain, and body. Thus a soul or individual may "hunger" (Ps. xx. 19) after spiritual food or sustenance (Prov. vi. 30); and also "thirst" (Mat. v. 6); or be "troubled" (Ps. lxxxviii. 3); or "vexed" (2 Kings iv. 27); or "melted" (Ps. cvii. 26); or fear (Acts ii. 43); or lust (1 Pet. ii. 11); or commit sin (Lev. xviii. 29; Lev. v. 2); or be wearied of life (Job x. 1); or bitter (Job x. 1); or it may lie (Lev. vi. 2); or cry out (Job xxiv. 12); suffer adversity (Ps. xxxi. 7); or die (Rev. xvi. 3; Ps. lxxviii. 56); or be abominable (Is. lxvi. 3); or may die (Rev. xvi. 3); or may rest (Jer. vi. 16; Mat. xi. 29). These are traits of character, some being psychological and others pathological, traits of healthy or unhealthy soul-life arising, the former from healthy and the latter from morbid conditions and aberrations of the vital forces and laws of soul existence; and proving, moreover, that the soul is the individual. The psychology and pathology of the soul are important studies. They are altogether distinct and different from those of the mind, morals, or body. And yet every doctor and divine knows how intimately they are interlaced and correlated; and also how dominant the former are often over the latter.

25. Like the body, intellect and morals, so the soul has its diseases. These are grouped together under the generic term Sin (Mic. vi. 7). The Holy Scriptures

enumerate nearly two hundred spiritual manifestations; some of which are decidedly wrong or morbid, even in their minor forms, *e.g.*, infidelity (1 Tim. v. 8); craftiness (2 Cor. iv. 2); malice (1 Cor. xiv. 20), &c.; and others which by excess may merge into evil, such as jesting (Eph. v. 4); flattery (Dan. xi. 32); feeble-mind (1 Thess. v. 14); ignorance (Rom. x. 3); men-pleasing (Eph. vi. 6); perversity (Numb. xxii. 32), &c. One of the saddest features of the Fall was that it included and entailed a hereditary tendency to soul-sin in the Adam-Eve offspring. That is, the human soul became not only prone to but preferred evil to good; generally preferring to sin in thought, word, and deed; to error in body, mind, heart, or soul, one or all; apt to do what God hates and desires us to shun, things and thoughts that it should be our highest interest here and hereafter to avoid, namely, sinful or soul aberrations and defilements.

Soul disease or sin is the worst disease in the world; therefore that which Man ought most to oppose; and, above all, to prevent by wise hygienic measures; because:—

a It is the only true universal and world-wide disease; inasmuch as it attacks man, woman, and child alike; none escape (1 John i. 10); no one is free from its taint and tendency through life. It is the world's great human disease, its leprosy; leprosy typical of sin and sin typical of leprosy.

b It is the most deadly and persistent disease; which, if unchecked is unfailingly fatal for the next world at least if not for this (Ez. xviii. 4).

c It is the world and Man's worst disease, as it attacks his copestone, the soul, his ego, his noblest and divinest part.

d It is the most difficult of all diseases for Man to treat and master, even the individual; because occult, hidden from outward eyes, felt and known by none but the sinner; and often hugged, not opposed (Mic. iii. 2); and aided by his unseen foe (Gen. iii. 1), the whisperer (Gen. iii. 1).

e It is the most recurrent of all diseases; relapses from all its forms are frequent, often in intenser forms, owing to weak resistent power, and our innate love for besetting sins: therefore the most difficult to eradicate and stamp out.

f Sin is the most contagious of all the diseases to which humanity is subject.

g It is the human disease which is most hateful to God; because:—

1. It affects, seduces, alienates, ruins His offspring, Man, in whom He takes such interest.
2. It thwarts God's beneficent, paternal, and redemptive plans for us.
3. It has grievously affected the Trinity (Gen. vi. 6).
4. It was originated and is propagated by God's greatest foe, the rebel spirit, Satan, and his emissaries.

The soul, as the ruling agent in the body is necessarily involved in every sin we commit and soul disease we initiate. It becomes guilty and accountable for this. The temptation to this may originate in the soul itself; or by suggestion from without through the individual's own brain or body; or those of some other being. It may originate in our own hereditarily sin-prone self; or in the alluring temptations of the world, the flesh, and the devil. In every case it is an aberration, morbific, and a disease; a departure from soul-health, which has to be opposed, and either prevented or cured. The human soul thus has, like the body, mind, and heart, its conditions of health; likewise its departures from this or diseases: and these imply that the soul requires and should have certain health conditions and a special health environment: vital surroundings of life that favour its innocency and purity of life and health (3 John ii.). It may, failing this, have one which favours it again, and perhaps often, relapsing into sin, when tempted. It also requires a salubrious environment to aid its restoration to health, happiness and vigour when it has sinned. It requires a restorative as well as a curative hygiene: both however being not very dissimilar.

Soul disease or sin is totally distinct from disease of the mind, morals, or body. It is not a physical or physiological affection like leprosy, scarlatina, inflammation, &c.: but something intangible like the soul itself, and its healthy manifestations, such as love, reverence, &c. But it may secondarily manifest itself by the physical and physiological agency of the body and its different organs and functions, especially the heart, brain, and intellect. For example, Satan's spiritual pride begat rebellion; that led to sinful brain mentation; that again to sinful acts. So also in human experience: sin, engendered by a faulty soul idea leads to neglect of public worship, prayer, Bible study, sabbath desecration, &c., &c. A being suffering from a soul ailment thus has a variety of disease of far more importance to the individual and of deeper import to God than any physical ailment. Especially as soul, sin or disease,

whether instilled or innate, may lead indirectly to sin and disease of the mind, intellect, heart, and body, and thus implicate the entire individual and evolve a mass of disease of different kinds, but all equally to be deplored and often hard to combat; so hard that sin is termed soul-leprosy in the Holy Scriptures, to indicate its loathsomeness and stubborness. Soul sin, such as this, is therefore as much a disease and a pathological factor in Nature as a physical disease of the body like leprosy, a moral one of the heart like lust, a mental one like ambition. And a soul disease or sin, at first localized where engendered or instilled in the soul itself; may secondarily involve the brain, intellect, and mind, and by these evolve faulty thoughts; or it may also involve the heart, affections, and social functions, by suggesting sinful words and deeds; or it may likewise drag the body into the sin by inciting it to sinful actions. This is illustrated by the story of Adam and Eve in Eden; a tale that has had its many imitations and variations daily ever since. Backsliding (Jer. iii. 14), no matter what its nature, is falling back into sin, perhaps again and again is of the same nature and likewise pathological. The soul, both in health and in disease, thus comes into the category and the fold of Nature. In both conditions it is swayed by Heaven-devised forces and laws; vital in their nature. And in the soul life as in animate nature generally, both animal and vegetable, we find its story both in individuals, families, nations, and the race full of examples of the punishment of violated laws. We see this in disease of soul. And we see it in a disease favouring misuse or neglect of soul hygiene, the hygienic laws of God. If a man neglects his spiritual nature for a time the soul degenerates and atrophies in correspondence with a well-known law of Nature by which health and type become reversed. Neglect the body persistently and lengthily by an inferior hygiene and his body degenerates towards the standard of his savage forefathers; neglect the brain and intellect and he dwindles down to the grade of the imbecile or idiot; neglect his conscience and his morals and he becomes lawless and vicious; neglect the soul, and this and the individual shrinks, shrivels, decays, atrophies. It retrogrades till every vestige of its Divinity is gone and God's image is lost. By hygienically neglecting organs or their functions we induce the disease called atrophy; an interference with Nature's laws, alike punitive in the physical, moral, social, and spiritual worlds; and not less so in the body, mind, morals, and soul of the microcosm, Man, than in the larger macrocosm of which he forms one item. Soul diseases are more prevalent and lasting; and of far more serious import than bodily ailments; and their issues eternal. Adam and Eve during the innocent period of their Edenic life were

free from them. Christ's mission and death were meant to minimize or stamp soul disease out; as that which most defiles Earth and degrades Man. When the soul "prospers" (3 John ii.), that is in full health and vigour, the heart is light and full of "peace" (Heb. xiii. 20); morals clean; the thoughts upright; and the body so full of felicity that it does not feel itself. The soul reigns supreme and seems alone existent. We are in high spirits and happy. On the other hand, when the awakened soul sins and is "sick" (Is. i. 5), the heart, mind, morals, and body are all correspondingly depressed in pure sympathy. These facts are the universal experience of almost every soul that lives; at least of every true Christian, and need no further illustration. Thus proving that the non-medical but yet Divinely-inspired Paul is as correct an exponent of pathological as he is of physiological truth when he says, "whether one member suffereth all the members suffer with it; or one member is honoured, all the members rejoice with it (1 Cor. xii. 26). Thus it is that in the human frame spiritual, mental, moral, and bodily diseases are all interlaced and interdependent, mutually acting and re-acting on one another; even as the different organs and functions do in health.

26. The soul also has its death (Ezek. xviii. 4). Some explain this term regarding that which is elsewhere termed immortal (Gen. xii. 13), by translating the term as meaning "condemnation" only. Divines may settle this discrepancy of opinion. In either case it has a deeper and more serious meaning than soul disease: and infinitely more than body disease or even death. Moreover, mean what it may, one thing is certain, namely, that as God and His spiritual Word have spiritual lives, so has Man the "*living* soul" (Gen. ii. 7). And that possessing this, he must also have a soul as well as a body death. But for God's purposes neither Man's soul nor his body would have been created; and but for the soul and its earthly mission Man's body would never have come into existence. He has the length of both lives in His control, and it is His prerogative to end them when He pleases.

27. Soul conversion or soul cure is the deliverance of the soul from sin or soul disease now spoken of, and from a pathological soul environment: and implies that process by which the Holy Spirit awakes the dormant and indifferent soul of Man, only innately aware of the existence of a God, to be "born again" and roused into active spiritual life, enabling it to realize:

a That the God to whom our spirit innately rises in adora-

tion and for help in trouble, and who is practically so far an "unknown God" (Acts xvii. 23) is Jehovah of the Bible, the only true God.

b That He is our creator, preserver, saviour, and the custodian of our fate.

c To realize His omnipotence, omnipresence, and omniscience.

d God's love and its depth for us; His chief attribute.

e That we are individually and racially sinners, and rebels against Him.

f That He loves sinful and rebellious Man; though hating their folly.

g So deep is His love that He sent Christ to die as an atonement for human sin; and that by this only can we be forgiven.

h That we are thus doubly His; by creation and by redemption.

i That Man is altogether God's; soul, body, mind, and heart. We are His offspring, creatures, children, and property. And ought to be His disciples and followers to do with as He will, for time and eternity.

k That it is in Him and His creation, by Him and His aid, and through Him and His will that we continue to live, move, and have our being.

l That we are each personally responsible to God for these our "gifts of God" (2 Tim. i. 6); and will be individually punished for neglect of this privilege and duty (Mat. xxv.).

m That we should be both ashamed and afraid to dare to sin, seeing that we are:—

1. A Divine spirit or soul that we may not wantonly defile (Luke xii. 20).
2. A "temple" (2 Tim. i. 14), of the third person of the Trinity, namely, the Holy Ghost, which dwelleth in us.
3. We may have the second person in the Trinity to dwell in our heart and make that His throne, if we will (Colos. iii. 5), and may thus consecrate the human breast as Jehovah's dwelling.

n That it is our interest and duty to hate, fight, and forsake sin; lead a new life in, to, and for God; of which love and devotion to God, zeal in His service, work for Him, and suppression of self, are the chief characteristics.

o That though conversion does not prevent the soul altogether and always from succumbing to sin's allure-

ments; it at least tends to keep it from the greater sins, and minimizes the lesser ones: makes us sorry for even minor lapses; constantly and earnestly strive against them; ever ask God to pardon the past, help the future, and lean more and more on Jesus for pardon, pity, and aid to lead a consistent Christian life, such as He approves.

p. That no individual can keep even His own soul (Ps. xxii. 29; Prov. xxiv. 12; 1 Pet. iv. 19); nor can he deliver His own soul from sin or its punishments (Is. xliv. 20; Ezek. iii. 19-21): nor offer or make his soul an offering for sin (Is. liii. 10); God and Christ alone can do that (Ps. lxxxix. 48; xxxiii. 28; xxxiii. 18), and redeem the sinful souls of men (1 Kings i. 29).

q That we are saved not for what we are, may be, or do even in God's service, but by faith alone, *i.e.*, in Christ crucified as our only Saviour.

28. The soul is thus a distinct entity, that requires its special food (John iv. 32); and its drink (1 Cor. x. 4); and its air (Gen. ii. 7); an entity that has its health (3 John ii.); its life (Ps. xxxv. 3); its sicknesses (Job x. 1); its death (Ps. lxxviii. 50); and shall live eternally (Gen. xii. 13); that may be taken away (Job xxvii. 8); may be destroyed by our own self (Prov. vi. 32; viii. 36); or punished eternally (Ps. xvi. 10; Acts ii. 27): that may repent (Ps. xli. 4); and be healed (Acts x. 38); may be saved (Heb. x. 39); is in God's hand (Job xii. 10); held in life by Him (Ps. lxvi. 9); that we may keep (Deut. iv. 9); but only by God's grace (Ps. xxii. 29); with which *alone* we are to seek God (Deut. iv. 29); and serve Him (Deut. x. 12). It follows that the soul, like the mind, morals, and the material body, has certain conditions and a certain environment that best suits its health and vigour. And also faulty conditions and surroundings that act injuriously on these. The soul thus has its own special spiritual hygiene; acted on and controlled by spiritual forces, and these again by spiritual laws.

29. As the soul itself, its life, health, and diseases, as well as its hygiene, the forces and laws which act on these for good or ill, are all occult, intangible, and more or less incontrollable by us than is the case with our physical health, it is necessary that we should have perfect faith both in the giver of any system of spiritual hygiene and in the practical efficacy of his gift.

30. In the Holy Scriptures we find such a system; that we can find nowhere else; far more full and complete and minute than in the body, mental, and moral hygiene, likewise found therein; a spiritual hygienic code that forms the copestone of and is necessary to complete Jehovah's hygienic code of health laws for Man in his entirety; a "living soul" dwelling in a living body, gifted with a mind and morals.
31. Clearly also to make God's spiritual hygiene of the Bible effective, it is necessary that we should not only believe His system, but also study it and carry it into practice.
32. To make it effective we must personally pursue its lessons. We cannot buy or hand over the soul's hygiene to another, any more than we can purchase the soul itself (Rev. xviii. 13). As with salvation (Ps. lxii. 1) each must work out the soul's hygiene for himself: especially as its details differ with individuals.
33. If we conscientiously study and carry out strict spiritual hygiene, the well-pleased God who owns our souls will aid and promote our efforts to keep and preserve our most precious possession, and one of His most valued (Ezek. xviii. 4; Prov. xxiv. 12; Ps. xcvii. 10; 1 Pet. iv. 19; Jas. i. 21; Ps. cxxi. 7).

On the other hand there are many things we do not know regarding the human soul, and doubtless will never be able to discover. Chief among these are:—

1. God is a spirit (John iv. 24). So is the human soul, but necessarily of a vastly inferior nature (Ps. viii. 5). But what a spirit or soul, even our own, really is; what it is like, its nature form, &c., we know not. This is one of those "mysteries" that are as yet kept from us, doubtless for some wise reason (1 Pet. i. 12). That it is not of a very much attenuated and invisible gaseous nature, whose existence is difficult to demonstrate, like the inter-stellar Ether; we may conclude, for even that is material. The spirit called the soul of Man is an immaterial entity. We are as human beings so mixed up and incorporated with the material world that as yet we cannot comprehend or even imagine an immaterial entity, such as a soul; or that such an entity should possess another life than our body life, and be capable of thinking, conversing, working, perhaps even in material things. Nor can we conceive ourselves in the light of God's servants and agents: the immaterial agent of the immaterial Jehovah. These are matters that will doubtless be

made plain at death when our spiritual eyes and mind first open in the spiritual world and our freed soul enters and occupies its new and spiritual body (1 Cor. xv. 44). The spiritual world is doubtless inhabited by many and varied creations, including archangels, angels, cherubs, spirits that do His will (Heb. i. 14), the hosts of heaven, altogether different from anything earthly and material; intangible to our physical senses, unanalyzable by our physical and chemical methods, and even incomprehensible to our brain generated ideas. And yet an entity that God has seen fit to incorporate for a time and a definite purpose with an earthly framework or corporeal body: an amalgation that, for all we know, may extensively prevail in that illimitable part of Nature that lies beyond Earth, that greater, vaster, wider, and infinitely more important realm of whose existence those countless orbs of Heaven and the Holy Scriptures are our chief evidence; a realm whose centre is God's dwelling place and throne; and round which the whole creation of suns, systems, and nebulae circle; each as it is formed occupying its allotted orbit; all matter and spirit obeying the will and doing the work of the mighty creative master-mind. The human soul is one of those spiritual entities sent for a time to occupy a fleshly body; and perform here the first part of its own special rôle in Nature; a rôle planned like all else by Jehovah. Man is not Divine, but his soul or permanent self is; and also eternal; and its destiny for weal or woe in our own hands. The soul must have a structure, for God made it, and that for a special dwelling and purpose (Jas. iv. 5); a structure possibly more wonderful and elaborate than the body. The healthy human soul ranks with those intelligencies and powers that do, or at least strive to do, God's will. Too many, alas, claim kindred with another class of spiritual entity, from which Jehovah is striving hard to dis-associate them; and has given His spiritual hygiene and promised his own special personal aid, if we will accept it (Jas. i. 2), in a process of self-reform of the highest and indeed vital personal import.

2. Nor do we know anything of the nature of the union that exists between the spiritual soul and the physical body. It is mysterious and past our human comprehension.
3. Equally mysterious to us yet is it whether the soul is

generally distributed over and amalgamated with the body, or if it has some special local site and dwelling. And if the latter, what organ or part of the body is thus specially honoured by acting as its abode and its medium of activity.

4. Nor may we discover its last stronghold and place of departure at death. No one has yet and probably never will see, hear, or feel a soul leave a dying body, even from their best known and dearest. This it probably does with the last breath, the final respiratory effort and last physiological act of the expiring body: the departing soul-spirit, more viewless and intangible even than the faint evanescent attenuated air of the dying frame.

This positive and negative evidence regarding the human soul, infinitely the most precious of all our earthly possessions, renders it abundantly apparent how imperatively necessary it is that we should individually find out how to best behave towards and most wisely treat the soul within us, and is our very self, so as to promote our own best interest, temporal and external, and, above all, please our Owner and Redeemer, the Deity; how to preserve it as free as possible from sin and mundane taint (Jas. i. 27); make its Divine growth satisfactory (1 Pet. i. 22); avoid soul death (Jer. xxxviii. 17), and disease (Mic. vi. 7), and help it to ultimately appear faultless before the judgment seat of God (2 Cor. v. 10). The wisest treatment of the soul is to give it the best possible environment to promote its health and vigour and oppose soul weakness, disease, and disaster. To surround it with and envelope it in the conditions that are most likely to benefit, develop, and make it purer, holier, and more godly: and ward off deteriorating and morbific or destructive agencies. Our human environment is that in which we live, move, and have our being. Our soul environment is the most important part of this. The modifying action of environment is as evident in soul as in mental, moral, or bodily matters. It may be good, bad, or indifferent. The principle of life lies in and is an endowment of the organism, the soul; but the conditions and outcome of soul life lie in the selection of the environment. This is merely an extension to spirit life of the law already pointed out as forming part of the moral, mental, and physical life of the human being. Life, vegetable, animal, and spiritual is everywhere acted on, modified, aided, or opposed by its environment. Our object is to bring back the sin-soiled human soul to health, and to keep it so through life. If we attain this the entire human being is healthy and sound throughout. A perfectly healthy individual is one in which the soul, mind, and body are all healthy and work together harmoniously

and vigorously: one in whose organs and functions the hygiene and hygienic environment has been not only perfect but also successful: one in whom the soul in health and hygiene takes and keeps the mastery. An individual may be physically, mentally, and morally healthy, and yet lack the most important item which completes perfect health, namely, the spiritual. A spiritually minded individual in an invalid frame is more to be envied than one gifted with earth's best health but lacking spiritual health and vigour of soul (Prov. iv. 23).

There is no secular, spiritual, or soul hygienic system, strictly so called: no hygienic scheme developed by secular sanitarians for that part of humanity the existence of which but for the Holy Scriptures we should even now be in total ignorance, and probably never able to find out. Divine soul hygiene, enunciated by Jehovah in His Holy Scriptures, the same book which reveals the existence of the soul, is all we have to inform us. And yet that is sufficient; for it teaches us deeply and fully; and gives us far more and more important information than it does regarding other departments of human hygiene, such as the mental, moral, and even the hygiene of the body. Clearly, therefore, both our duty as Christians, and our interest as living, responsible human beings lies in finding out from our only source of information, and from one so august and authoritative, what is the environment best adapted for satisfactory soul health and hygiene: and to ascertain what the Holy Scriptures that furnish this information says.

The same Almighty Being who gave us souls and a special casket and abode for them, also gives us full and invaluable advice how to treat, use, and care for them best. The hygiene of the soul is the most abundant, valuable, and widespread of all the sanitary advice of the Holy Scriptures; runs persistently like a thread through the warp and woof of the whole book from beginning to end; and towers in value and frequency far above the other hygienic factors. No other book or authority, ancient or modern, can supply this. And no other authority but the Supreme could have conceived and formulated them; for no human being could possess the necessary knowledge. Spiritual forces, laws, and matters, even those concerning our own selves and souls, are still far beyond our human ken or control, and are likely to remain so. Man is so largely of physical mould, and his spiritual nature not only, humanly speaking, so mysterious, hidden, and yet undeveloped, that in all spiritual matters, even regarding ourselves, we are not permitted to discern much, and only to see that little as "through a glass darkly," and thus to know and estimate spiritual things very imperfectly.

The question therefore, what are the hygienic factors best

adapted as an environment for the human soul; to promote its health, vigour, prosperity, happiness, and hygiene; and what those are which are apt to militate against these, and instead of them induce disease, weakness, unhappiness, and adversity, at least in the soul itself, and probably in the whole individual, heart, mind, and body, is a most important subject of enquiry. Here we can only give them in outline; as the theme is vast and best studied in the incomparable original. It is only by investigating, and still more by practising, the first or salutary factors and avoiding the second or insalubrious ones that individuals can keep themselves, that is their ego, the soul, as Jehovah, its Lord and Master and Donor, desires it should be kept for Him, as well as for our own earthly and eternal interests.

To effect this vitally important purpose, Jehovah has not left mankind to their own weak human investigations and tardy discoveries regarding a branch of hygiene, the psychical, in which we should have wandered even further and more hopelessly in doubt and darkness than in physical, mental, and moral sanitation: but has given an incomparable educational system, for which the race, and especially Christians, cannot be sufficiently grateful. This Divine scheme comprises the indoctrination in knowledge, not instant, but gradual, on a well devised succession of tuitional grades, based on clearly defined knowledge of Biblical, that is Heavenly, derivation. Thus:—

a The opening of the spiritual or soul *eyes* and *Faith* by the Holy Spirit to unseen eternal mysteries and vital facts regarding the spiritual world, to which we partly belong, and spirit life with which we are partly animated; matters of infinitely greater import than earthly matters; and to facts regarding the soul of Man, not always or indeed generally revealed to the learned, the great, or the wealthy; but oftener to babes, the pure in heart (Mat. v. 8) and to the unlettered, the poor in spirit (Mat. v. 3).

b The awakening of the *understanding* to see the necessity for and importance not only of the study, but also the practice of a careful, energetic, and continued personal, public and national system of spiritual or soul hygiene.

c The awakening of the human and the general *conscience* to see that it is both our personal interest and our duty to God and our fellow creatures to attend to these hygienic matters.

d To awaken an *interest* in spiritual hygiene; the copestone of the hygienic factors; by shewing that the Divinity has Himself devised, formulated, and revealed a spiritual hygienic code exactly such as Man requires; the best that exists or that could be evolved

by human ingenuity for preserving the health and preventing disease in the soul, and possibly in the other departments of the human entity. A spiritual hygienic code, which is far-reaching, comprehensive, advanced, practical, effectual and welcomed by all awakened souls. This code and its different items we find in the Mosaic Code, in the later teachings of Jesus, and in those of the Prophets, Apostles, and other Bible writers; all of which contain rules and maxims for spiritual hygiene of priceless value. So that no reader of this, the World's Book, can plead excuse or extenuation for neglect of the hygiene of his immortal and all-important soul.

e Another sequel is the awakening of the human *will* to study and learn this Biblical hygienic law and method; and to carry it into effect, as one of the most important of all the laws of Nature, even the vital ones among which it is classed.

f To awaken our *gratitude* for this additional proof of Godly and Fatherly love for and interest in Man, racially and individually.

g To awaken and add to our *love* for and confidence in Him, not only as our Maker and Preserver, but as our best friend, adviser, guide, and support.

h To awaken and endorse our veneration, love, and *trust* in the Holy Scriptures as our best and only spiritual hygienic guide-book for time and eternity. Without such a primary and initial belief, acquiescence, and practical endorsement of this Biblical mode of hygienic instruction, the soul sanitary knowledge revealed by Jehovah in His Bible would usually be ignored, and His beneficent efforts for our good wasted.

The following may be given as the chief unhygienic agencies which "war against" the soul (1 Pet. ii. 11) and tend to deteriorate or destroy its health and life:—

1. Satan, the powers of evil, and their emissaries are the human soul's chief enemies. These include:—

a Unwise, ungodly, and vicious parents, who set their children a bad example at the most impressionable age, when evil lessons in speech, voice, and action, that do far more than starve, they poison the docile infant soul; lessons of irreligion, vice, and depravity in speech, voice, and action, easy to learn but hard to efface from the recipient eye, ear, and brain.

b Badly chosen companions are apt to do the same thing. God considers it a crime, and solemnly warns against the fatal consequences of attempting to injure, and

especially to lead astray the people of God (Deut. xxiii. 3; Numb. xxv. 16-18).

c The perusal of irreligious, immoral, and vicious books; and indulgence in similar amusements, are equally bad.

d Lack of education or vicious teaching, in which mind, morals, heart, body and soul are alike tainted; when the education of our higher nature, the soul, morals, heart, and mind are forgotten and neglected.

e Neglect of certain important devotional duties which God has ordained and commanded as wise, good, and necessary for us; namely, Church-going, Bible-reading, and private prayer.

f An unfortunate environment which combines the whole of these.

2. Sin is another potent unhygienic soul factor, which comprises innate or hereditary sin derived from our first parents, and self-generated sin, originating in our own corrupt nature. Sin is ever present (Ps. li. 5); always near to conquer us if it may. Many have besetting sins, varying in kind and intensity with the individual. Sin in its various forms and grades is the weapon by which Satan instils evil, overcomes our weak human nature by attacking our vulnerable points, and exciting the desires, affections, lusts, &c., that He knows are most likely to respond and succumb to His persuasions, temptation, and assaults. The Holy Scriptures speak of many of these great and small spiritual weaknesses, either sinful in themselves, or which merge into real sin, if indulged in too freely.

On the other hand the chief agencies which promote soul health and vigour, and are thus its chief hygienic factors, are the following:—

1. *God's help.* He alone by His Holy Spirit can open our spiritual or soul eyes to perceive:—

a Soul weakness, disease, and danger of death; its need for aid to prevent these, or, failing that, to recover from them.

b That the aid now spoken of can come from God alone (Ps. xcix. 8); and only when it is prayed for (Mat. xxi. 22).

c By doing our specified part and duty in the matter; according to God's instructions, as set forth in His Holy Scriptures (Phil. ii. 12).

Seekers after God must realize that as there is but one universe so there is only one God and Creator of Man and his soul; the universal God who is here and everywhere; towards whom Man's soul naturally tends; "Where is He whom my soul seeketh" (Eccles vii. 28); Lord over not only the material universe we see, itself only a fragment of creation, but also over

the far wider immaterial and spiritual universe, our earthly faculties do not permit us to view. The Scriptures furnish us with a double biological classification of mankind; namely, *first*, the spiritually inclined, "those nations which knew God" (Jer. xxvii. 7); and the worldly, "those nations which knew not God." This classification still prevails. But seeing that Man on being driven from Paradise did not amend by the lesson and punishment, but only went from bad to worse (Part 4, Chap. 2); Jehovah has compassionately told us how best to combat it; an effort which He has also promised to help if Man will individually permit: but not if he himself does not try. Jehovah helps those who help themselves. The early Hebrews in their wiser moments were true children of Nature, and set us an inimitable example of putting themselves and their soul in God's charge. "He shall hide me in His pavilion" (Ps. xxvii. 5); "He shall cover thee with his feathers" (Ps. xci. 4); "He dwelleth in the secret places of the most high" (Ps. xci. 1); "the wise are in the hand of God" (Eccles. ix. 1); "underneath are the everlasting arms" (Deut. xxxiii. 27); "thou art my portion, O Lord" (Ps. cxix. 57); "the Lord is the strength of my life" (Ps. xxvii. 1); "the Eternal God is thy refuge" (Deut. xxxiii. 27). To feel that we are "complete in Him" (Colos. ii. 10), and incomplete apart from God and Christ, is one of the best tests of true discipleship. Joshua's choice and his people's at Shechem (Josh xxiv. 15-18) was a wise one. One of the chief modes of serving God is to obey His commandments. These include His sanitary code. And in that the chief item is constant and deep attention to the hygiene of the soul. The decision of the still earlier Israelites of Sinai, "all the words which the Lord hath said will we do" (Ex. xxiv. 3), equally included attention to spiritual hygiene.

2. The pursuit of true Godliness and its numerous outcomes is another potent hygienic factor in soul hygiene. All souls have an innate craving, although often masked and obscured, for some life and aim better, holier, more peaceful, and satisfying to the soul and the higher nature than this world supplies: and for something nobler and greater than anything earthly or physical to worship, reverence, and love. Like gravitates most towards like. When Jehovah creates and detaches souls from Him, their source, and sends them from Heaven to inhabit human bodies; they involuntarily retain their obedience to this law of spirit nature, and gravitate towards their Divine centre and origin; round whom, as part of creation, they circle. Moreover, Jehovah has beneficently implanted and incorporated in every soul an instinct which impels it to turn towards, recognise, worship, rely, look for aid and support from a superior being of some sort, whom it recognises as its Creator and Pre-

server. This, however, has been materially marred and minimized by sin and the Fall, like Man himself, and human affairs generally. But in a minor form it still remains in every human being, savage and civilized. All people that on earth do dwell pray to a God or Superior Being of some sort; the heathen to him whom they "ignorantly worship" (Acts xvii. 23); Christians to the true God who has been declared unto them (Rom. i. 4). They pray, though too often, alas, not till in need of help from difficulty, danger, and distress. This so-called "natural" religion to distinguish it from that which springs from "Revelation": this implanted religious sentiment and faculty is the most splendid and sacred talent we possess. Like all else in Nature, and especially in Human Nature, like all other forces, it is subject to natural conditions and definite laws, which it is not our wisdom or interest to hide, but to investigate and utilize; because if we do not, as with all else, material and spiritual alike, Nature will cause it to atrophy and take it from us. There is thus a latent dependency in Man on a higher Being; a desire for light and knowledge regarding Him; and a craving for given and returned love for Him; as an outcome of this innate religious instinct. Revealed religion and the Holy Scriptures enables us to gratify the soul in these matters, by verifying the vague instinct and demonstrating who God really is. This innate religous instinct has only to be developed and rightly directed to again re-blossom and become as strong and as prominent an element in Man's nature as it once was, in Eden. Who can effect this beneficent end better than the Divinity who fashioned us; made the soul, spiritual forces, and laws? What better guide in spiritual matters and soul evolution and improvement can the human soul have than God? What better revealed help can be devised than that which He has bequeathed in His Holy Scriptures; and superadded to it the promised personal aid to accomplish, that most important and vital purpose, namely, the preservation of the health of our higher and better nature and the soul of Man by judicious spiritual hygiene. But this spirituality must be real, deep, and permanent; not shallow and evanescent. Otherwise it is unsatisfactory to the Omniscient, whom we cannot deceive; and to ourselves. A human being may be highly intellectual, and of the strictest morality; and yet lack spiritual mindedness and religion. Christianity forms the copestone necessary to complete the much to be desired "mens sana in sano corpore." The being who studies, and strives to practise all the hygiene of Jehovah, as found in the Holy Scriptures; the spiritual, moral, mental, and corporeal, because God directs him and because he recognises and acknowledges by the act, their infinitely greater value over all that is human; and their aptitude to effect

all that is desired on the health of Man and on his entire human entity, is the wisest and most far-seeing. Moreover, morality and spirituality are totally distinct. A man may be moral and yet very unspiritual. A Man who is truly spiritual minded must be moral. The latter includes the state of our feelings towards our fellow creatures. Spirituality indicates the state of our feelings towards God. The two, however, are closely intertwined, correlated, and mutually reactive, both in health and during aberrations. Moreover, strict morality is an unfailing result and proof of true spirituality.

This information we glean, not from secular sources, literary, theological, medical, philosophic, or otherwise; but from Holy Writ. Nor can we obtain any knowledge whatever of spiritual hygiene and the spiritual environment, or the spiritual life from secular sources; but only from the Bible and God. Reason, justice, gratitude, all combine to affirm that as humankind were and are God's property; as they are sustained, redeemed by, and dependent on him for pardon, grace, salvation, sustenance, life, health, the future, and all else, it is therefore impossible for any grateful individual to love, serve, or worship Him too much or too deeply; work too zealously for Him; develop their religious proclivities too greatly, or obey His laws, including the hygienic and the spiritual ones, too closely. No human being can be righteous overmuch. As a practical outcome it is clearly necessary that, while attending to God's laws, those of hygiene should not be forgotten, as they are equally imperative and their neglect equally punitive: and also that among these the hygienic laws for our higher nature, the mind, morals, and, above all, the soul; laws meant to promote our mental, moral, and spiritual health and vigour, as given so comprehensively in His comprehensive handbook, the Holy Scriptures, should not be ignored, considering their import; but even more zealously followed than all the rest.

That the individual pursuit of Godliness is one of the most prominent and powerful factors in spiritual hygiene; and therefore an imperative duty among mankind, both of the Mosaic and Christian dispensations, as well as all others, is evidenced by a multiplicity of Bible texts, which tell their story best without comment. Thus "Godliness is great gain both for this life and for that which is to come" (1 Tim. vi. 5-6); "Keep thy soul diligently" (Deut. iv. 9); "Seek Him with all thy soul" (Deut. iv. 29); "Love the Lord thy God with all thy soul" (Deut. vi. 5); "Serve the Lord with all thy soul" (Deut. x. 12); "Thou shalt love the Lord with all thy soul" (Mat. xxii. 37); "Glorify God in your body and spirit" (1 Cor. vi. 20): "that ye may be holy in body and spirit" (1 Cor. vii. 34); "God is a spirit, therefore worship Him in spirit" (John iv. 24); "whom

I serve with my spirit" (Rom. i. 9); "be in subjection to the Father of Spirits" (Heb. xii. 9); "to be spiritually minded is life" (Rom. viii. 6); "are not all ministering spirits" (Heb. i. 14); "if ye are led by the spirit" (Gal. v. 16-18). All of these quotations shew that one of our chief life duties is to walk ever in a godly spirit and frame of mind, seeing that "the kingdom of God is within" us (Luke xvii. 21). The natural aspiration of the *healthy* soul is "my soul doth *magnify* the Lord" (Luke i. 46). The best proof of the salubrity of the soul is "thy soul *prospereth*" (3 John ii.); it waits "*only* upon God" (Ps. lxii. 1); God is its "*refuge* and its *strength*" (Deut. xxxiii. 27): the soul finds its life in God: in close proximity to God it finds its native air and its best environment. On the other hand the *unhealthy* tendency of souls from innate and congenital sin is shewn by their tendency to avoid God's presence and seek other more congenial society: "He sent leasing to their souls" (Ps. cvi. 15): and then they tend to "gather with sinners" (Ps. xxvi. 9).

3. Certain imperative God-ordained Christian duties tend to promote soul health and spiritual hygiene: thus:—

a Weekly public worship on God's appointed day. We should "forsake not the assembling of yourselves together" (Heb. x. 25) as an open profession of Godliness and an example to strengthen the faith and duty of others. Unity and combination in religious as in other matters is strength. Christian concord and sympathy are helpful and spiritually hygienic.

b The frequent sacramental confession and vow to God over the Eucharistic bread and wine at the Lord's Table or Altar is highly sanitary to the soul, when love and duty impel, promise obedience, and compel performance of a Godly inner life, such as the all-seeing eye of God can approve.

c Frequent private prayer with confession of our faults, sins, and weaknesses to God; and of our desire to do better, and daily think, speak, and act more as Christians should and as Christ did walk; combined with constantly renewed requests for the Saviour's aid in our upward soul-hygienic aspirations. In the Mosaic dispensation, when a sacrifice was offered it was to be voluntary and of their own free will and from the heart (Lev. xix. 5). So in the Christian dispensation, if we offer God the sacrifice and service of prayer, it must come from the heart, and be voluntary as well as sincere. The Scriptural illustrations of prayer and praying are numerous besides Daniel's three times a day (Dan. vi. 10); David's morning and noon (Ps. lv.

17); Christ's frequent prayer (Luke xviii. 1; Mat. xiv. 23); and His incomparable, masterly, comprehensive, and Divine example of what a prayer should be (Mat. vi. 9); nor need it be indoors (1 Tim. ii. 8); but anywhere (Mark i. 35; Luke v. 16); but wherever offered it must be sincere, like the Sadducees and not Pharisaic (Luke xviii. 11; Mat. vi. 5; xxiii. 14): and pure (Job xvi. 17); as part of our confession of faults to God (Jas. v. 16).

d Frequent perusal and study of the Holy Scriptures. Because its spiritual and moral maxims and teachings are of the most elevating and valuable character: with which none of the writings and sayings of the saints, sages, and teachers of antiquity or of modern times can for a moment be contrasted, any more than the light of the moon can be compared to that of the sun. The teachings of God's Holy Scriptures form the basis and indeed sole foundation of the hygiene of the human soul; the only source whence we can learn its best environment for its highest health and future welfare.

e Frequent conversation on sacred and Biblical matters with other Christians and Bible students is an oft-shunned duty: yet one that is countenanced by Holy Writ (Mal. iii. 16). This frequent speaking "one to another" on Godly subjects not only sharpeneth the countenance (Prov. xxvii. 17), but also the soul and the mind regarding spiritual matters: of far more importance than our usual topics of talk.

f Works; work for God, is necessary as one of the best proofs of the reality of our Godliness. "What doth it profit my brethren if ye have faith but have not works. Can faith save us?" (Jas. ii. 14). Again, "if faith hath not works it is dead in itself" (Jas. ii. 17). So also "faith apart from works is barren" (Jas. iii. 20). So, again, "By works faith is made" (Jas. iii. 22). And also, "a man is justified by works and not only by faith" (Jas. iii. 24); and "faith apart from works is dead" (Jas. iii. 26). Therefore, both faith and works are a necessary part and evidence of real Christianity.

4. The conduct of the *inner* or *hidden* life. A wisely ordered circumspect walk and conversation, like that of our pattern man, Jesus, is a most important factor in our spiritual hygiene. The main agent in this is self-study and introspective commune with our own soul (Eccles. i. 16). The wisest of all studies is that of ourselves, especially the soul and all that

concerns it. The best of all knowledge is self-knowledge. Each individual leads two distinct lives; namely an outer or public life, patent to all the world, open, seen by, and known to all; and an inner secret, private heart life, known only to our individual selves and to the heart-searching and all-seeing God from whom nothing, even unspoken thoughts, can be hid, though perhaps kept from our nearest and dearest. These two lives in the same individual may be wholly dissimilar; and the person lead a deceitful life. We may openly think, say, and do uprightly and privately quite the opposite, like the hypocrites: clearly the outcome of an unsanitary diseased soul. Again, the inner, hidden, or private life is also double; inasmuch as it consists of our body or fleshly life, and our spiritual or soul life, against which the former often wars and leads the soul or individual into evil (1 Pet. ii. 11). We may deceive human kind as to our inner life, but never God. Towards the Heart-searcher we need only have one kind of life and that a true and loyal one. If our outer life savours of hypocrisy; worse still if our inner life does this; and saddest of all if we permit the bodily desires to overcome the soul's Godly aspirations, and we fail to keep ourselves "pure and unspotted from the world" (Jas. i. 27), we are clearly "none of His" (2 Tim. ii. 19). Our inner life is therefore by far the more important of the two, as it is the true life and that alone by which Jehovah judges, weighs, acquits, or condemns us. Therefore it should be our great aim to please God rather than men (Ephes vi. 6) in life matters. Jehovah's spiritual hygiene is meant for the supervision and conduct of the inner life, the secret soul life, as the surest mode of effecting His purpose, and making both the outer and the inner life correspond, and developing the individual into all that He desires Him to be.

It is not so much in our outer life and contact with our fellow creatures as in our inner life and with our real selves; and especially in our conduct of the war so often waged even in the best of Christians between the body and the soul, between our worldly and our spiritual tendencies and aims; that the real conflict against sin and Satan, the combined forces of evil, "the world, the flesh, and the Devil," and all things that militate against the soul and bring it and the body into subjection (1 Cor. ix. 27); must be carried on. It is here that strict and constant spiritual or soul hygiene is most required. No human being is a true Christian, a real follower and disciple of Christ, whose inner life is not as open and ready for inspection and as pure as his outer. Nor is he one if he does not fight hard and ever do his best to overcome evil in whatever shape it comes. It is not the mere outward mechanical routine and morality of body life that marks the veritable man or woman of God; but

the hidden existence and routine of the soul, heart, mind, and morals; known to and seen only by the well-pleased All-seeing; who notes both what and how much evil we each resist; and when, where, and why we fail. The outer world only discovers, and too often, alas, gloats over the failures of Christians, even when few, but little recks of the multitude that are resisted, even by the best Christians. For the better the Christian the fiercer and more persistent the foe. The foes of the human soul are fierce, strong, untiring, and subtle beyond mortal ken. They are two in number, viz.:—

a *Sin.* This is ever present (Rom. vii. 17), indwelling and innate in all since the Edenic Fall; easily besets us (Heb. xii. 1); and by which we are so often, so much, and so easily beguiled (2 Pet. ii. 14). This enters into our souls by many different channels. To fight it successfully we must keep a constant watch and control over ourselves, our every organ and function, corporeal, mental, moral, social, and spiritual: and with a strong hand avoid evil, come in whatever shape and form it may, thought, word, or deed. We must be strong to do and to be what God would have us; to walk in the footsteps of Jesus, our model man; make our lives as far as possible like His; strive to act, think, live, walk and speak towards God, our fellow creatures, and ourselves, as He did who was "pure, undefiled, and separate from sinners" (Jas. i. 27); though in the world to live and to learn, yet not "of the world"; or permitting ourselves to be defiled thereby (Titus ii. 7); our heart affections and desires being in Heaven (Gal. v. 24); loving its God and ours "with all our heart, soul, mind, and strength."

b *Satan*, God's fierce foe and ours, the author of all evil; we must also fight with equal vigour. He hates us because so loved and pitied of God, whom he delights to vex and thwart by leading us into sin in the myriad ways at which he is an adept; and by the many weak and oft unguarded channels by which he so often makes entrance; finding mankind as a rule as simple and easy a prey as Eve and Adam, whose sad conquest we so often decry: his strength and our weakness making it all the more incumbent on us to resist and crush his evil whispered suggestions, whether these come direct by and through the agency of our own vulnerable spots or indirectly by the influence of injudicious and blameworthy companions, books, &c. Our success in this two-fold soul battle against the greatest power of evil, Satan, and his many-edged

weapon, sin, is shewn by the result. And in judging this, actions speak better in our self scrutiny than words what we truly are. Our inmost thoughts are a still better private test of our spiritual condition. "If we have not the spirit of Christ we are none of His" (Rom. viii. 9). Nor are we if we do not "love one another" (1 John iv. 12); or if we do not keep God's commandments strictly and feel they are not grievous (1 John v. 3); or if our private monitor, the conscience, condemn us (1 John iii. 20). If we cannot meet those tests "our religion is vain" (Jas. i. 22); our spiritual condition perilous; our soul hygiene and environment faulty; and we ourselves but as "sounding brass and a tinkling cymbal" (1 Cor. xiii. 1). A human being is like a mollusc; our shell being the body; and the active living agent the soul within. It matters little how, what, or where the shell has been placed by God's providence, so long as the vital part within is hygienically right and salubrious. This happy condition and sequence many no doubt reach; though not during the whole of their lives. For even with the Godliest of Christians, life is but a series of repeated but much bewailed falls and uprisings.

5. Corporeal hygienic factors. But our soul's health and its spiritual hygiene are apt to be attacked and demoralized not only by outward factors and forces like those now adduced; but also by others from within; by certain prominent and important internal organs, members, parts, and functions of the body; those by and through which the soul, heart, and mind hold intercourse with God and with the outer world, and are the agents by which these manifest their thoughts, intents, and actions, good, bad, and indifferent: and by which our higher spiritual nature is apt to be dragged down, its health interfered with, and soul disease and disaster induced.

a The Conscience. The Holy Scriptures give many hints, hygienic and otherwise, regarding this inward Heaven-implanted judge and monitor and witness of right and wrong in the thoughts, words, and deeds, of our daily life (Rom. ii. 15; ix. 1); making it a good test of the condition of the soul's health and vigour. It is the judge and bar which convicts us when we sin (John viii. 9); acquits when we do right (Acts xxiii. 1); warns against evil doing; and approves of right. Thus it gives us the main signs of a good or healthy and sound conscience; for example, "living in a good conscience" (Acts xxiii. 1); a conscience "void of offence" (Acts xxiv. 16); a conscience that can "bear

witness" in the Holy Ghost (Rom. ix. 1); one subject for conscience sake (Rom. xiii. 5); the "testimony of our conscience" (2 Cor. i. 12); a "good" conscience (1 Tim. i. 5); faith and a "good conscience" (1 Tim. i. 19); a "pure" conscience (1 Tim. iii. 9); a "perfect" conscience (Heb. ix. 9). On the other hand it gives the indications of a morbid, bad, or diseased conscience; thus, a "weak" conscience (1 Cor. viii. 10); a "seared" conscience (1 Tim. iv. 2); a "defiled" conscience (Tit. i. 15); a conscience full of "dead works" (Heb. ix. 14); an evil conscience (Heb. x. 22). As hygienic indications we have "convicted by our conscience" (John viii. 9); and the "answer of a good conscience" (1 Pet. iii. 21). The conscience is thus of vast import in soul hygiene to tell when our conduct is for our soul's welfare or for its detriment; to indicate whether we are behaving for our soul health or so as to court soul disease and death. Its testimony is therefore of great hygienic value in this the most important branch of our human hygiene, the spiritual (2 Cor. i. 12). We should endeavour to keep it pure as a proof of the sincerity of our faith (1 Tim. i. 19; iii. 9). The conscience is the test of our fealty to God (2 Tim. i. 3; 1 Pet. iii. 16-21). A conscience seared with a hot iron and hardened (1 Tim. iv. 2), or defiled (Tit. i. 15), or full of dead works (Heb. ix. 14), or evil (Heb. x. 22), indicates spiritual or soul disease and backsliding, resulting from a faulty spiritual hygienic and sanitary environment, which it is our highest duty, privilege, and interest to remove and amend. Our success is shewn when we become "perfect" (Heb. ix. 9), as indicated by the conscience (2 Cor. v. 11). Conscience as a factor in soul hygiene is thus most important.

b The Heart. This is one of the most important factors in soul hygiene or disease and in the spiritual hygiene of humanity; because it is through this figuratively that the soul's workings manifest themselves. The Biblical literature of heart hygiene is large but most important. This organ is figuratively credited with being the seat of the desires, passions, and feelings (Judg. v. 15), good, bad, and indifferent. Physiologically it is merely the central and chief motive power of the all-important blood circulation. Yet its nerve supply makes it exceedingly sensitive to mental, moral and spiritual emotions and feelings; and far more responsive to these than any other organ in the body.

Hence the prominence given this muscular blood-propelling pump, in mental, moral, social, and spiritual philosophy, health, and hygiene: a prominence endorsed by Holy Scripture, which is full of allusions to the part which the heart plays in mental, social, moral, and, above all, in spiritual health and vigour, and their hygienic preservation and restoration when lost by the initiation of spiritual degeneracy and soul disease through the evolution and dominancy of one or other of the many different forms of spiritual ailment alluded to in Holy Writ; and specially mentioned there that we may definitely know, and knowing, evade them. The Scriptural allusions to heart, health, and vigour, and to heart evils and weaknesses; to the benefits which flow from the former, the disasters that flow from the latter, and to the means best adapted for promoting our heart, and thereby our soul, hygiene; for giving these a good environment, and for obviating an indifferent or faulty one, are all fully illustrated in Holy Writ, and purposely so by Jehovah, for our weak, errant, vacillating nature and education in heart sanitation.

Thus the Bible gives many bad traits of heart, indicative of spiritual morbidity, degeneracy, and danger. Thus lack of perceptivity (Deut. xxix. 4); a double heart (1 Chron. xii. 33; Ps. xii. 2); a froward heart (Ps. ci. 4); a proud heart (Ps. ci. 5; Prov. xvi. 5); a mischief devising heart (Prov. vi. 18); a subtle heart (Prov. vii. 10); a perverse heart (Prov. xii. 8); a deceitful heart (Prov. xii. 20); a backsliding heart (Prov. xiv. 14); a foolish heart (Prov. xv. 7; xxii. 15); a froward heart (Prov. xvii. 20); a haughty heart (Prov. xviii. 12); a wicked heart (Prov. xxvi. 20); a heart set to do evil (Eccles. viii. 5; ix. 3); a fat heart (Mat. xiii. 15); a rash heart (Is. xxxii. 4); a rebellious heart (Jer. v. 23); a heart which is uncircumcised (Jer. ix. 26); deceitful and desperately wicked (Jer. xvii. 9); stony (Ezek. xi. 19); slow believing (Luke xxiv. 25); covetous (2 Pet. ii. 14); imagines only evil (Gen. vi. 5); obstinate (Deut. ii. 30); turned away (Deut. xvii. 17); lifted up (Deut. xvii. 20); stony (Job xli. 24); gathering iniquity (Ps. xli. 6); fretting against God (Prov. xix. 3); adulterous (Mat. v. 28); walking after the eyes (Job xxxi. 7); cursing (Eccles. vii. 22); not perfect with God (1 Kings xi. 4); not right (Ps. lxxviii. 8); tempting God (Ps. lxxviii. 18); erring (Ps. xcv. 10); fat as grease (Ps. cxix. 70); imagining mischief (Ps. cxl. 2); studying destruction (Prov. xxiv. 2); worldy (Eccles. iii. 11); mad (Eccles. ix. 3); far from God (Is. xxix. 13); idolatrous (Ez. xiv. 3);

covetous (Ez, xxx. 31); iniquitous (Hos. iv. 8); divided (Hos. x. 2); exalted (Hos. xiii. 6); hard (Mark vi. 52); vailed (2 Cor. iii. 15); blind (Ephes. iv. 18); God-forgetting (Deut. viii. 14); wicked (Deut. xv. 9); proud and naughty (1 Sam. xvii. 28); perverse heart utterances (Prov. xxiii. 33); hasty to speak (Eccles. v. 2); proud (Jer. xlix. 16; Ob. iii.); weak (Ez. xvi. 30); Satan-filled; not right in God's sight (Acts viii. 21); not wholly turned (Jer. iii. 10); turned from God (Deut. xxix. 18); snares (Eccles. vii. 26); deceived (Deut. xxii. 16); hardened (Mark viii. 17); faint (Lev. xxvi. 36); cursing God (Job i. 5); mischief (Ps. xxviii. 3); lustful (Ps. lxxxi. 12); adamantine (Zech. vii. 12); dissembling (Jer. xlii. 20); strife loving (Jas. iii. 14); double-minded (Jas. iv. 8); wanton (Jas. v. 5).

On the other hand the Holy Scriptures give equally pithy good traits of heart, health, and vigour: signs of a correct spiritual environment. Thus a heart with great thoughts (Judg. v. 15); great searchings (Judg. v. 16); a new heart (1 Sam. x. 9); understanding (1 Kings iii. 9-14); of melody (Job xxix. 13); rejoicing in God's statutes (Ps. xix. 8); merry (Prov. xv. 13); pure (Prov. xxii. 11); discerning (Eccles. viii. 5); contrite (Is. lvii. 15); righteous (Eccles. xv. 22); new heart and spirit (Ez. xviii. 31); of flesh not stone (Ez. xxxvi. 26); meek and lowly (Mat. xi. 29); singleness and God-fearing (Col. iii. 22); true (Heb. x. 22); prepared to seek God (2 Chron. xxx. 19); integrity (Ps. lxxviii. 72); fixed and God-trusting (Ps. cxii. 7); established (Ps. cxii. 8); changed (Dan. iv. 16); Lord-rejoicing (1 Sam. ii. 1); soft (Job xxiii. 16); unreproaching (Job xxvii. 6); Godly (Ps. iv. 7); heart not condemning us (1 John iii. 21); perfect with God (1 Kings viii. 61); pure (Ps. xxiv. 4); charitable and pure (Zech. x. 7); integrity (Gen. xx. 6); tender (2 Kings xxii. 19); not envying sinners (Prov. xxiii. 17); humble (Dan. v. 22); law-filled heart (Is. li. 7); Lord opened (Acts xvi. 14); set to seek God (1 Chron. xxii. 19); God-strengthened (Ps. xxxi. 24); God-seeking (Ps. lxix. 32); single (Eph. vi. 5); kind and tender (Eph. iv. 32); wise (Ex. xxviii. 3); God touched (1 Sam. x. 26); God-seeking (2 Chron. xi. 16); upright (Ps. cxxv. 4); law-written (Heb. viii. 10; Jer. xxxi. 33; Rom. iii. 15); inclined to God (Isa. xxiv. 23); God-spirited (Gal. iv. 6); Christ occupied (Eph. iii. 17); Melodious to God (Ephes. v. 19); ruled by God's peace (Col. iii. 15); God-stablished (1 Thess. iii. 13); Lord directed into love (2 Thes. iii. 5); Lord-sanctified (1 Pet. iii. 15); day-star arisen (2 Pet. i. 19).

The Holy Scriptures also pointedly furnish many hygienic factors and surroundings as indications and hints to be studied and followed to produce a strong and healthy heart, one of the

main items towards a wise spiritual hygiene. Their importance in this the most important section by far of our human hygiene seems to warrant a full record. Thus wisdom of heart (Ex. xxxv. 35); serving God with heart-gladness (Deut. xxviii. 47); perfect as the heart of David (1 Kings xi. 4); wise in heart (Job ix. 4; Prov. x. 8); an understanding heart (Job xxxviii. 36); a righteous heart (Prov. xv. 28); which teacheth his mouth and directeth his tongue (Prov. xvi. 23); prudent knowledge-getting (Prov. xviii. 15); with the heart man believeth (Rom. x. 10); doing God's will from heart (Ephes. vi. 6); serving God with all (Deut. xi. 13); loving Him (Luke x. 27); turning to God with all (Deut. xxx. 2); walking before Him with all (1 Kings ii. 4); returning with all our (1 Kings viii. 24); following God with all (1 Kings xiv. 8); seeking God with all (2 Chron. xv. 12; xxii. 9); praising God with all (Ps. lxxxvi. 12); trusting God with all (Prov. iii. 5); believing with all (Acts viii. 37); speaking truth in the heart (Ps. xv. 2); law of God in it (Ps. xxxvii. 31); heart rejoicing in God's salvation (Ps. xiii. 5); seeking God's face (Ps. xxvii. 8); inditing good matter (Ps. xlv. 1); fixed in God (Ps. lvii. 7); crying for the living God (Ps. lxxxiv. 2); hiding God's words in it (Ps. cxix. 11); inclined to God's statutes (Ps. xix. 36); asking God to search (Ps. cxxxix. 23); not inclined to evil (Ps. cxli. 4); a bed-communing heart (Ps. iv. 4); walking with perfect heart (Is. xxxviii. 3); serving God with perfect heart (1 Chron. xxviii. 9); seeking God with heart (Deut. iv. 29); loving Him with the heart (Deut. vi. 5); serving Him (Deut. x. 12); God's commands written on tables of heart (Prov. iii. 3); walking in uprightness of heart (1 Kings iii. 6); praising God with whole heart (Ps. ix. 1); keeping God's precepts with the whole heart (Ps. cxix. 69); crying to Lord with whole (Ps. cxix. 145).

It is by avoiding the morbid and following the good indications of heart culture that we may give the spiritual hygiene as thus influenced the best conditions and environment for aiding its prosperity and health. Nor must we forget God's relation to the human heart. These texts shew clearly how He hates the evil traits of the heart; and how He approves, countenances, and aids the good ones. The heart-knowledge of the Omniscient is all-seeing and perfect. God knows the heart of man (Acts i. 24); searches it (Rom. viii. 27; Rev. ii. 23); trieth it (Ps. vii. 9); pondereth it (Prov. xxi. 2); shines into it (2 Cor. iv. 6); He looks not on the actions or words but on the heart (1 Sam. xvi. 7); knows its secrets (Cor. xliv. 21); it is God who prepares it (Prov. xvi. 1). From these we glean hints and inducements to ask God's aid in our individual heart-hygiene. An additional reason is that it affects not only

the mind and soul and their hygiene, but also the body; seeing that a sound heart is the life of the flesh (Prov. xiv. 30); not only physiologically, but also psychologically.

c The *mind* and *thoughts*. The hygiene of the mind and intellect have elsewhere been considered *per se*. Here we are to regard it and its mentation as guided by the healthy or morbid soul, the former prone to good, and the latter to evil. The Holy Scriptures give many hygienic hints of both kinds. Thus we have the following signs of varying degrees of spiritual unhealthiness of mind; sorrow (Deut. xxviii. 65); wickedness of mind (Prov. xxi. 27); foolishness (Prov. xxix. 11); pride-hardened (Dan. v. 20); doubtful (Luke xii. 29); reprobate (Rom. i. 28); carnal (Rom. viii. 27); fleshly (Ephes. ii. 3); vain (Ephes. iv. 17); puffed up fleshly (Col. ii. 18); defiled (Tit. i. 15); bad (Numb. xxiv. 13); earthly (Phil. iii. 19); high (Rom. xi. 20); feeble (1 Thess. v. 14); ready (2 Tim. iii. 4); double (Jas. i. 8); despiteful (Ez. xxxvi. 5); evil-affected (Acts xiv. 2); blind (2 Cor. iii. 14); corrupt (2 Cor. xi. 3). On the other hand it gives many signs of a healthy, spiritually-inclined mind: thus, willing (1 Chron. xxviii. 9); working (Neh. iv. 6); stayed on God (Is. xxvi. 3); ready (Acts xvii. 11); humble (Acts xx. 19); law-serving (Rom. vii. 26); fervent (2 Cor. vii. 7); willing (2 Cor. viii. 12); one mind (2 Cor. xiii. 11; Phil. i. 27); lowly (Phil. ii. 3); Christian (Phil. iv. 2); meek, humble (Col. iii. 12); firm (2 Thess. ii. 2); sound (2 Tim. i. 7); law-abiding (Heb. viii. 10); ready (1 Pet. v. 2); wise (Rev. xvii. 9); good (Numb. xxiv. 13); God-loving (Mat. xxii. 37); sober (Tit. ii. 6); pure (2 Pet. iii. 1). The Holy Scriptures likewise give certain conditions of mind that we ought to aim at reaching because highly healthy and of hygienic importance; thus "a mind stayed on God" (Is. xxvi. 3); a spiritual mind (Rom. viii. 27); God-glorifying (Rom. xv. 6); Christian mind (Phil. iv. 2); a renewed mind (Rom. xii. 2; Ephes. iv. 23). By strenuously cultivating these we are giving the mind the best possible spiritual environment. Allied to mind-spiritual hygiene are its thoughts, as signs of a healthy or morbid condition. Thus among the morbid or evil thoughts given in the Holy Scriptures as coming from the heart (Mal. vii. 21), we may give, thinking the gift of God can be purchased (Acts viii. 20); thinking ourselves like God (Ps. l. 21); thoughts of foolish-

ness (Prov. xxiv. 9); evil thoughts (Ezek. xxxviii. 10); taking thought for our life (Mat. vi. 25); or raiment (Luke xii. 26); God not in all our thoughts (Ps. civ.); vain (Ps. cxix. 113); wicked and abominable (Prov. xv. 26); unrighteous (Is. lv. 7); iniquitous (Is. lix. 7); vain (Jer. iv. 14); evil (Jer. vi. 19; Jas. ii. 4); cursing (Rom. ii. 15). On the other hand, our thoughts may be good and healthy; such as thoughts of God's loving kindness (Ps. xlviii. 9); thinking on our ways (Ps. cxix. 59); thinking on God's name (Mal. iii. 16); not thinking ourselves worthy (Luke vii. 7); when a child thinks as a child (1 Cor. xiii. 11); deeming God's thoughts precious (Ps. cxxxix. 17); asking God to try and know our thoughts (Ps. cxxxix. 23); righteous thoughts (Prov. xii. 5); thoughts of the diligent (Prov. xxi. 5); peaceful thoughts (Jer. xxix. 11). The result of Christianity should be to bring into captivity our every thought (2 Cor. x. 5). And in mind and thought hygiene we should not forget with whom we have to do: not with Man, but with Him who knows the inward thoughts of every one (Ps. lxiv. 6; xciv. 11; 1 Cor. iii. 20); He is a discoverer of the thoughts (Heb. iv. 12). His thoughts are not ours (Is. lv. 8); but higher (Is. lv. 9); and we know them not (Mic. iv. 12); although He knows ours. The hygiene of the mind and its mentation, as influenced for good or for evil by the soul, is thus of great importance.

d. The Tongue and Words. As with the conscience, heart, and mind, so the utterances of the mouth form a good index of the good or bad spiritual condition of the soul and its hygienic environment. The tongue is the chief organ by which Man's higher nature and his soul, brain, heart, body, thought, desires, and passions manifest themselves. How great, therefore, must be its influence for good or for evil, to ourselves and others, according to the nature of its outcome; and the influences which prompt what it utters. Hence no doubt why the Holy Scriptures dilate so much, so deeply, and so often regarding this organ and its function; and of the care we ought to take to prevent it speaking aught unguided by reason, justice, purity, and Godliness. These Bible texts mark the tongue as a potent hygienic agent for preserving the soul's health, life, purity, and happiness, or the reverse, according to its guidance. No secular exposition of what the Holy Scriptures say on this subject can be

so clear, plain, and pointed as the sayings themselves, regarding what the human tongue is, and can do for Man's weal or woe by its utterances or its silences. The tongue is a potent agent for evil or for good to the individual soul, its friend or its foe according as it is swayed by this entity alone in a healthy condition, or only by the unaided and worldly mind, body, affections, passions, and desires, with or without the superadded influence of external agencies of evil, sin, Satan, &c. Hence why the wise and Christians are advised to keep the tongue from evil (1 Pet. iii. 10); from framing deceit (Ps. l. 19); from devising mischief (Ps. lii. 2). The tongue may be a sharp sword (Ps. lvii. 4); or lying (Ps. cix. 2); or false (Ps. cxx. 3); or proud (Prov. vi. 17); or froward (Prov. x. 31); or naughty (Prov. xvii. 4); or perverse (Prov. xvii. 20); or babbling (Prov. xxv. 23); or flattering (Prov. vi. 24); ungodly (Is. iii. 8); a devouring fire (Is. xxx. 27); perverse (Is. lix. 3); wicked (Hab. i. 13); unbridled (Jas. i. 26); a fire (Jas. iii. 6); untameable (Jas. iii. 8); iniquitous (Job. vi. 30); deceitful (Job xxvii. 4); sinful (Ps. xxxix. 1); double (1 Tim. iii. 8); serpent-like (Ps. cxl. 3). All of these obnoxious, errant, and more or less morbid and sinful oral emanations and manifestations of the wayward mind, morals, and soul should be strictly avoided and striven against as potent factors in soul health and hygiene.

On the other hand, the Holy Scriptures indicate in what directions the tongue may contribute to soul health; or at least act as an index of the spiritual condition of the soul and individual: thus when it speaks of God's righteousness (Ps. xxxv. 28; li. 24; lxxi. 24), a soft tongue breaketh the bones (Prov. xxv. 15); a wholesome tongue is the tree of life (Prov. xv. 4); the tongue of the wise is health (Prov. xii. 18); and the law of knowledge (Prov. xxxi. 26); the tongue of the wise useth knowledge (Prov. xv. 2); the answer of the tongue is from the Lord, if we ask Him to guide it (Prov. xvi. 1); who keepeth his tongue keepeth his soul (Prov. xxi. 23; Prov. xvi. 1); it is for the tongue to confess that Jesus is Lord (Phil. xxi. 11); a glad tongue is the index of a rejoicing and healthy heart and soul (Prov. xii. 18); like Moses who was naturally reticent, Christians should be slow of speech (Ex. iv. 10). Humanity should therefore clearly be especially careful and follow David's advice and "take heed that we sin not with the tongue" (Ps. xxxix. 1); or utter iniquity (Job vi. 30); or deceit (Job xxvii. 5); seeing that death or life are in the power of that little organ (Prov. xviii. 21); and it is wise to keep the tongue

from evil (1 Pet. iii. 10). *Words* uttered by the tongue and speech are also a pretty safe index, at least when unpremeditated, of soul health and a wise environment of their fount, the soul or individual; or of the very reverse. The Holy Scriptures chronicle morbid or unhealthy words; such as those despising the word of the Holy One (Is. v. 24); speaking against the Son of Man (Luke xii. 10); or our words may be idle (Mat. xii. 36); or offensive (Jas. iii. 2); or vain (Ex. v. 9; Is. xxxvi. 5); gift perverted (Deut. xvi. 19); fierce (2 Sam. xix. 43); multiplied without knowledge (Job xxxv. 16); darkening counsel (Ps. xxxviii. 2); iniquitous (Ps. xxxvi. 3); devouring (Ps. lii. 4); snaring (Prov. vi. 2); sinful (Prov. x. 19); wicked (Prov. xii. 16); tale-bearing (Prov. xviii. 8); transgressing (Prov. xxii. 12); falsehood (Is. lix. 13); deceitful (Ephes. v. 6); without wisdom (Job xxxiv. 35); multiplied against God (Job xxxiv. 37); hasty (Prov. xxix. 20); unholy (Jer. xxiii. 9); slander (Prov. xviii. 10; foolish (Prov. xxix. 11; iniquitous (Job xv. 5). Those words which indicate a healthy soul and frame of mind and a good hygiene are also given in Holy Scripture. Thus if they are righteous (Ps. cxix. 123); good and gladdening (Prov. xii. 25); fitly spoken (Prov. xxv. 11); exhorting (Acts xiii. 15; Heb. xiii. 22); of salvation (Acts xiii. 26); wisdom and knowledge (1 Cor. xii. 8); of reconciliation (2 Cor. v. 19); good (2 Thess ii. 17); in season (2 Tim. iv. 2); of power (Heb. i. 3); of peace (Deut. ii. 26; Esth. ix. 30); esteemed (Job xxiii. 12); wise (Prov. i. 6); pure (Prov. xv. 26); mirthful (Prov. xxii. 21; Acts xxvi. 25); gracious (Eccles x. 12; Luke iv. 20); acceptable (Eccles xii. 10); good (Zech i. 13); mighty (Acts vii. 22); of faith (1 Tim. iv. 6); prophecy (Rev. i. 3); true and faithful (Rev. xxi. 5); spirit guided (Acts ii. 4); wisdom (Prov. i. 21). It is also pointed out that God may put words in our mouth (Numb. xxiii. 5). His words should be "sweet to our taste," considering their Divine source (Ps. cxix. 103); their entrance should give light; and why not hygienic insight. Our human words may be good, bad, or indifferent; but not so God's; as Man lives by the words that proceed out of the mouth of God (Mat. iv. 4), and they are wholly good. His word is nigh us (Deut. xiii. 4) and easily found.

So likewise of *speech* or connected words. The Holy Scriptures speaks similarly of this. It may be healthy and good, or the reverse, indicative of a wise or a faulty environment; a healthy soul life or the reverse, and a safe hygienic indication. Thus our speech may be bad or good (Gen. xxiv. 50); wicked (Ps. cxxxix. 20); evil (Tit. iii. 2); false (Jer. xliii. 2); lying (Zech. xiii. 3); much (Mat. vi. 7). Or it may be good to praise the Lord (Ps. cxlv. 21); truthful (Zech. viii. 16; Eph. iv. 25); right (Prov. xvi. 13). So the Holy Scriptures give many

hygienic hints regarding speech as an index of our spiritual condition. We should not speak as pleasing men (1 Thess. ii. 4); but slow to speak (Jas. i. 19). Many other examples might be cited, but these will suffice.

The *mouth* is also employed by Holy Scripture as typical by its utterances of soul-health, or the reverse; and as giving intentionally introduced hints to avoid the latter and follow the former; and the hygienic environments and conditions which aid them; all of them hints on a most vitally important subject, beneficently supplied by "Him who made Man's mouth" (Ex. iv. 11). Thus the Holy Scriptures among many other examples of spiritual morbidity as evidenced by the mouth, quotes lying (Ps. lxiii. 11); wicked and deceitful (Ps. cix. 2); vain (Ps. cxliv. 8); froward (Prov. iv. 24; viii. 3); or foolish (Prov. xv. 2). On the other hand the mouth may be righteous, speaking wisdom (Ps. xxxvii. 30); just (Prov. x. 31); upright (Prov. xii. 6); flattering (Prov. xxvi. 28). Again, we find many apropos hygienic indications. Man's mouth must be held with a bridle (Ps. xxxii. 9); as it is deep (Prov. xviii. 4); a fool's mouth is his destruction (Prov. xviii. 7); whereas the mouth of the upright shall deliver them (Prov. xii. 6). God can give us a mouth and wisdom (Luke xxi. 15); and put words in it (Ex. iv. 15). The importance of this bodily organ in spiritual hygiene is shewn by remembering that it is the mouth which is honoured when we glorify God (Rom. xv. 6); and it is with this that we make confession to Him (Rom. x. 10). That the emanations of the tongue, lips, mouth, words, and speech are good, is a clear sign of spiritual salubrity and soul health. If the reverse they indicate morbidity of soul, weakness, and an unhealthy environment. In the latter case it is clearly wise to endeavour to improve and make them more of the healthy variety by guiding the hygiene of these organs, especially the tongue, accordingly.

So also throughout the *Holy* Scriptures the *feet* and footsteps as agents of the soul and spiritual nature are often cited as hygienic or unhygienic factors; the former when they lead us towards God and the latter when they carry us towards evil. Of themselves they are passive in the matter; the motive power in both cases being the will, mind, and soul, the ego, the individual. Thus they may run into evil (Prov. i. 16). Or they may be delivered from falling (Ps. lvi. 13). They may be set in a large room (Ps. xxxi. 8); or on a rock (Ps. xl. 2) by our Divine Hygiest.

In like manner the functions of other important parts and organs of the human frame, such as the hands, eye, ear, face, taste, acts, works, the body as a whole, are very frequently quoted in Holy Scripture as figuratively pointing to, and as indices by their acts, of the spiritual condition of the soul; bad,

good, or indifferent; as furnishing a clue to a healthy environment for the soul's health; and indicating what we ought to avoid to aid this and prevent spiritual decline, detriment, and disease. To quote further regarding these would only overcrowd the text.

The *Soul's* own attitude and actions as a separate and dominant entity is often spoken of in terms indicative of its health, vigour, and proclivities towards God and good or the reverse; thereby giving us most valuable and vitally important hints on spiritual hygiene; how the ego or soul ought to behave, and what it should do for the furtherance of its highest and eternal interest, which necessarily involve its earthly welfare; and what it should not do, but avoid, in order to promote the same great object.

Thus bad and unhygienic soul traits are when it sins (Lev. iv. 3; v. 1); or lies (Lev. vi. 2); is idle (Prov. xix. 15); or evil (Prov. xxi. 10); delighting in abomination (Is. lxvi. 3); or lusts (1 Pet. ii. 11); gathers with sinners (Ps. xxvi. 9); dried away (Numb. xi. 6). As examples, out of many good traits and signs of soul health we may cite, especially as hygienic indications and suggestions of what ought to be our hygienic environment. Thus the real Christian is known by setting his soul to seek God (1 Chron. xxii. 19), the great Being, Jehovah, in whose hand is the soul of everything (Job xii. 10); who delivers the soul from death (Ps. xxxiii. 19); redeemeth the soul of His servants (Ps. xxxiv. 22); because it is precious (Ps. xlix. 8); who can send leanness into it (Ps. cvi. 15); or permit its death (Ps. lxxii. 14; lxxviii. 50); who can make it rejoice (Ps. lxxxvi. 4); or spoil it (Ps. xxii. 23); make it live (Is. lv. 3); and be as a garden (Jer. xxxi. 12); who is good to it (Lam. iii. 25); desires all its love (Mark xii. 33); makes it believe (Heb. x. 39); and turn to Him (2 Kings xxiii. 25; 2 Chron. xxxiv. 31); keeps it back from the pit (Job xxxiii. 18); does not leave it in hell (Acts ii. 31); but can punitively or beneficently vex it (Job xxvii. 2); restoreth and leadeth it (Ps. xxiii. 3); keeps and delivers it (Ps. xxv. 20); makes it wait on Him (Ps. lxii. 1); and Him only (Ps. lxii. 5); longs for Him (Ps. lxxxiv. 2); preserves it (Ps. lxxxvi. 2); strengthens it (Ps. cxxxviii. 3); makes it joyful (Is. lxi. 10); makes it magnify Him (Luke i. 46); wait for Him (Ps. xxxiii. 20); love Him with it all (Mat. xxii. 37); makes it prosper (3 John ii.); seek Him with it all (Deut. iv. 29); serve Him with it all (Deut. x. 12). And seeing that humankind individually cannot keep their own soul (Ps. xxii. 29), but requires God's aid, we should clearly do all that we possibly can to keep it diligently (Deut. iv. 9). If we do not, we sin against (Prov. xx. 2); and wrong (Prov. viii. 36); and perchance destroy it (Prov. vi. 32). Whoso would please God

can do so best by keeping His commandments; because thereby He keepeth Man's most precious trust and that in Man which is of such infinite value to God, namely His *soul* (Prov. xix. 16). Chief among God's many laws of Nature are His hygienic ones for mankind; and supreme o'er these again are those which He has thus plainly and beneficently pointed out for the health, vigour, and general welfare of the permanent being, the immortal soul of Man. No department of human hygiene is so important to Man as the spiritual. There is no other system that he ought to study more assiduously, or follow more persistently and trustfully than Jehovah's; the God who makes, owns, and values human souls at their true worth; a matter which even the best of Christians, far less unregenerate humanity, cannot accomplish.

6. *Social* factors. The soul's vigour, health, and even life are very apt to be influenced for good or for evil, and its hygiene interfered with and benefited or demoralized by certain outer or social factors, which ought, but yet do not always work for our benefit, and, above all, for our spiritual good. These social agencies are all the more dangerous, because human, constant, close, and powerful. These are:—

a The *parentage*: most potent for good or for evil to the offspring. Even the infant's observing faculties and imbibition of good or evil are awake. First impressions are strongest; and those of our earliest years are never effaced. The good example of a Christian father, mother, and family; not alone on those who directly benefit by it, but outside the home circle, is incalculable, life-lasting, and often phœnix like in its old-age re-appearance when apparently dead. Early religious impressions are strong. So is their lack. Can there be a doubt that it was the home life and religion of Jocebed and Amram that under God's direction saved Moses from Egyptian idolatry. They preserved true Godliness, to be afterwards fanned into flame by God.

b *Companionships.* Godly companions, brought up in the fear and nurture of the Lord are better for the soul's example and health than such as swear, drink, debauch, gamble, sabbath-break, and indulge in other forms of vice. Vice is more apt to be learnt because more enticing than virtue. Like gravitates towards like. As the human soul naturally gravitates towards and seeks God: so souls of like proclivities naturally draw towards one another. Good and godly to similar souls; ungodly ones to their fellows. Wise souls seek those similarly inclined. The Christian courts Chris-

tian fellowship, profits by, feels the better and spiritually stronger by it. He naturally turns towards those of like mind; and now, as in the days of Malachi, "they that fear the Lord speak often to one another (Mal. iii. 16). Christians should be neither afraid nor ashamed to converse on and discuss Biblical subjects; often more interesting and always far more important than ordinary topics of conversation. To be otherwise is a certain sign of an unhealthy spiritual hygiene.

c *Literature.* A carefully selected literature is an important matter for soul sanitation: and the avoidance of all that degrades or demoralizes: this being a most important source of soul sustenance and spiritual food and drink. Among books the Bible should clearly be Man's mainstay; and, as with David, our delight (Ps. cxix. 16; xxxv. 70). Incomparably the wisest men and women are those who make the Holy Scriptures, God's book for Man in his entirety and especially for his higher being, their chief study, and often peruse them for instruction in holiness and Godliness; the means of best pleasing Him whose we are and to whom we owe so much; how to best satisfy, live, work, act, and speak for Him, obey His laws; become all that He desires, true disciples, His sons and daughters, real Christians. Daily spiritual food from the Bible is as hygienic a soul necessity for the Christian's soul health as the daily bread for which we so ardently pray for our body (Job. xxiii. 12); a necessity for all, not for Divines, preachers, and teachers of the Word only; necessary for the soul nutriment of every individual soul born into the world. Where can we find a better aid for self scrutiny with a view to self-conducted and God-aided improvement of Man's moral, social, and especially his spiritual nature. No book so closely and accurately scrutinizes Man's thoughts, desires, motives, and aspirations, good, bad, and indifferent: so searches out the unhealthy hidden secrets of the heart, disposition, and character; or gives the true remedy for their alien workings, as the Bible does for that fallen and sinful being Man: or furnishes a better and clearer contrast of Man in his degradation and guilt, as compared with the Holy God who made him in His own image, and whose purity and attributes of soul and heart and life we should clearly endeavour hard to imitate, as is His dearest and constant wish.

d *Education.* This ought to be of the same exalted

character: and mainly Godly and Christian. To give a human being, fitting on earth for eternity, a wholly secular education is tantamount to the child acting independently of and oft contrary to his Maker-parent; the scholar independently of his Teacher, who ordains otherwise. It is nearly as unwise as it again would be to give a purely religious education, as this would unfit the child for battling with the world. The two ought to be judiciously combined to fit us for our present Earth-life, and our future existence elsewhere. Religion should be our chief study here; the Bible our guide-book; our chief aim to do God's will, act as He would have us, be His disciples and children from birth to death: as Man was placed here by God to train for His service elsewhere. Hence it is why nothing is more carefully inculcated in the law and Bible generally than the duty of parents to teach their children its precepts and principles (Ex. xii. 26; Deut. iv. 5; ix. 10; Tim. iii. 15). While the slender trace of any other kind of education among the Hebrews of that early day shews of what the chief aim of Jewish education consisted; the wisdom and instruction so much spoken of in Proverbs; that these consisted mainly of the inculcation of religious and moral discipline after the precepts of the law, and the teaching and example of the home education and parents (Prov. i. 2-8; ii. 2-10). To this, however, Moses was an exception, as he was brought up in all Egyptian learning (Acts vii. 22); doubtless to initiate him subsequently and more fully into its folly and depravity. Again, the writer of Job was evidently well versed in natural history and the astronomy of the day (Job xxxviii. 31, 39, 40, 41). Daniel and his companions in captivity were other exceptions (Dan. i. 4-17). Solomon was another; whose intellectual gifts and acquirements made him even more renowned than his political ones (1 Kings iv. 29; 2 Chron. ix. 1-8). Otherwise religion and God's service were made to interpenetrate everything the Hebrews thought, said, or did. And it ought to be so now and ever. The nursery, school, home, business mart, should not eliminate God from our thoughts. In all we meet sin in its myriad forms; and when equipped we are best able to meet and conquer it. The education of the body, mind, morals, and heart are important matters, even for this world; still more so from their bearing on the soul's hygiene. It is important that this education should be wise.

> But it is the spiritual education of the soul that should be the chief end and aim of our earthly tuition. Like the body, mind, heart, and morals, so the soul enters the world and begins life as a plastic entity, to be moulded and educated for good or for evil as we will. Wisdom says that good and Godliness should be our chief aim and duty in soul instruction. This God ordains and will aid.

No one knows more or better regarding these hidden human matters, functions, and feelings of our frame than the God who planned and fashioned it and the being who took our nature and became flesh; and no hygienic handbook can instruct us better than His Bible on the subjects which He has taken especial care to elucidate and enunciate so clearly and simply that all who read may understand, even those of limited intellect and learning (Ps. viii. 2; Mat. xxi. 6). Nor can humankind of all grades do better than follow His advice on every one of these vital hygienic points in soul hygiene and spiritual endeavour. The Holy Scriptures clearly indicate the importance in Jehovah's sight of soul hygiene; and therefore point out what place ought to be occupied in our human eyes and endeavour by the inner, hidden, or soul life, and our Heavenly nature; and the care we ought to take of those hygienic factors over which we alone and God have control, to make and keep them as God advises; as part of His great hygienic scheme for Man's whole nature; namely, cleanliness in all things; not only in body, mind, morals, and heart, but also and especially purity of soul; not alone among individuals, but also among communities and nations (Ps. xcv. 10; lxxviii. 8; 1 Chron. xxviii. 29; Is. xxxiii. 15).

All humanity alike, both individually and collectively, should constantly and strenuously endeavour, if they would be spiritually sound, vigorous, and healthy, as the true and only lasting foundation of all prosperity, both temporal and eternal, to keep their conscience good (1 Pet. iii. 21); heart upright (Ps. cxxv. 4); mind stayed on God (Is. xxvi. 3); thoughts righteous (Prov. xii. 5); tongue from evil (1 Pet. iii. 10); words pure (Prov. xv. 26); speech truthful (Zech. viii. 6); mouth of wisdom (Luke xxi. 15); feet firmly planted (Ps. xl. 2); hands spiritually clean (Ps. xxiv. 4); eyes from seeing evil (Is. xxxiii. 15); ears spiritually open (Job xxxvi. 10); face unshamed (Ps. xliv. 15); taste appreciative of God's graciousness (1 Pet. ii. 3); actions fit to be weighed by God (1 Sam. ii. 3); our works faithful (2 Chron. xxxiv. 12); body undishonoured (Rom. i. 24); thus one and all contributing to keep the soul for God (Ez. xviii. 4); as He desires (Luke xii. 20). The spiritual education and evolution of the soul, the ego, the individual, by giving that

entity a wise and proper and healthy environment to develop it and its nature and capabilities, should form the climax and copestone of all human education: ranking in importance far above that of the body and even of the morals and mind. Its psychical and its educational evolution should proceed hand in hand, converging towards the same end, from the plastic infantine soul, until we attain unto a full grown man, into the measure of the stature of the fulness of Christ (Eph. xiv. 13).

Jehovah's chief design by this complex course of spiritual discipline and evolution is that errant, sinful, and rebel Man may of his own love and free will return Him soul allegiance, as figuratively dedicated by the affections, "my son give me thy heart" (Ps. xxiii. 26); as inciting us to do His will and serve Him, not so much intellectually as from the heart, that is by soul recognition, obeisance, and love (Ephes. vi. 7). To aid us the Holy Scriptures furnish us with evidences of the reality of our discipleship and Christianity; marks of full soul health; proofs of a good, true, pure, scriptural environment, after God's own model; and of satisfactory sanitary conditions of spiritual life: so that our personal monitor, the conscience, may accuse us if we do not attain the necessary standard; or excuse and free us if we let others know, imitate, and follow our Godliness. The All-heart Father longs most for His human children's soul, love, and fealty; not for their purely body or intellectual adoration. It was mainly for this that Man was created. The omniscient Heart-searcher acknowledges only practical, not theoretical, ingrained not superficial, particularized not generalized, real not sentimental Christianity; that which is a permanent part of the soul; Christianity for the sake of Christ our Redeemer and God our Creator. In matters of soul hygiene Jehovah is both our teacher and judge. And to attain the promised reward, a healthy redeemed soul, we ourselves must use all our best faculties, spiritual and otherwise. As we receive our earthly education from two sources, ourselves and others; so we receive our spiritual culture from two besides ourselves, namely, the Holy Scriptures and the indwelling Holy Spirit; whose temple we are (1 Cor. vi. 19). The soul must not be passive and inactive in the vital process of self reform, but an active agent, to work out its own salvation (Phil. ii. 12), its own destiny and future. God and Christ will aid us in this (John xvi. 24); our fellow creatures may desire and do all they can to help. But the chief agent is our own will to fight the battle with sin, temptation, evil desires, impulses, and Satan. There can be no deputies.

To still further aid us and our individual hygienic endeavours, and to assure us by critical introspection for self-guidance, we have the marks and evidences of a true Christian

clearly defined by the infallible critic, the Holy Scriptures. Thus; we "keep His commandments" (1 John ii. 3); we "walk as He walked" 1 John ii. 6); love the "brethren" (1 John ii. 9); "purify ourselves" (1 John iii. 3); we do "no sin" (1 John ii. 4); do no unrighteousness (1 John iii. 10); love one another (1 John iii. 11); are "compassionate" (1 John iii. 17); our "hearts condemn us not" (1 John iii. 21); "believe in Jesus Christ" (1 John iii. 23). If conscience condemns us in any, more so if on all, we may be sure we are not yet fully His; and clean every whit (John xiii. 10). If our heart condemn us not; but love of God, Christ, zeal in His service, a strong desire to do all that He bids and to be all that He desires, interpenetrates and rules our conduct; then we are Christ's true disciples and children of God, however imperfect we may feel.

Thus the human soul is not a simple but a very complex entity; and so therefore is its hygiene; it comprises many factors, and these occult in our present state and stage of existence. Man, of whom the soul forms the copestone, is himself a still more complex, doubly vitalized machine, gifted both with biological and spiritual life. He therefore requires a complex hygienic environment to keep him in life, health, and vigour. But of all his different organs, functions, and parts none requires a more complex series of hygienic conditions for the maintenance of its health, vigour, and existence, than does his spiritual nature or soul, the real individual. Soul hygiene is thus a complex study; and its practice not only difficult of itself, and because Man is more prone to sin than to holiness, and tends more to accept and follow a bad than a good soul environment; but also because the pursuit of a good environment is complicated and difficult to unregenerate or indifferent minds and souls. Soul hygiene is complicated not only because the soul entity is complex, but also because soul hygiene is so involved, correlated, and incorporated with that of the other organs, functions, natures, and parts of the human entity, one and all of them likewise very complex. Body hygiene is complicated, as it has many different organs and functions: but it has merely its own hygiene to study. Nor has the body the hygiene of the mind, morals, or soul to care for. So with the hygiene of the intellect and the morals; their hygiene is complex like themselves, but they have neither the body nor soul to look after hygienically. Soul hygiene is made infinitely more intricate and difficult, for its own is very complex *per se*; but also because this is so mixed up with that of the mind, heart, morals, and body. The soul or ego, the individual, has to watch and tend not only itself but the entire frame; and ought likewise to direct the entire human hygiene. On the fiat and decision of the soul rests, or ought to rest, in a

well and wisely-regulated life, the health, welfare, vigour, and life; the progress and evolution for good or bad, for health or disease, weal or woe, life or death of the entire human entity, body and soul, their every organ and function.

Not one only, even a selection of the best and most prominent of these chief factors in the Jehovistic scheme of spiritual hygiene, but all, will suffice to beget and keep soul health, and please the God who planned and bequeathed the best atmosphere and environment for the human soul which He creatively constructed. They must be all followed, and that fully and from the heart diligently, as unto God. And yet even that is not enough. A human being may attend Church, give alms, teach, and even preach, take sacramental vows, know his Bible by heart, pray often, and do many Christian works, and yet be far from the Kingdom of God (Mark xii. 34). Every one of these works is worthless and wasted if the devotion which prompts it comes not from the heart, and is the uncontrollable self-originated, spirit-aided aspiration of the healthy soul. Of this the inner life is the only sure test. This must be well ordered, pure and holy, right towards God and our fellow creatures (Lev. xix. 18). We need never offer lip or knee service or ostentatious Pharisaic worship (Mat. v. 20) to the Omniscient, who loathes half-devotion and hypocrisy (Mat. vi. 5); and only desires the adoration of those on whose heart His law is written (Jer. xxxi. 33); a law which necessarily includes the hygienic code we are now considering: and those whose chief delight is to do His will after its dictates.

That this personal introspection and successful espionage and estimate of our own true self and soul is not beyond human capability, is shewn by many scriptural selections; thus, "why call ye me Lord, Lord, and do not the things that I say" (Luke vi. 45), shews that it is not a super-human and impossible effort; "blessed are they that hunger and thirst after righteousness" indicates its possible, nay, actual, fulfilment (Mat. v. 6); "blessed are the pure in spirit" (2 Cor. vi. 6); "blessed are the peacemakers" (Mat. v. 9); and many others. These shew that success is not beyond our human capability; and that it is perfectly possible for us to successfully fight sin and Satan if we firmly try. As chief and incontestible proof above all we have recorded the immaculate career of the man Christ Jesus, who dwelt in our midst, lived our life, possessed our human passions and impulses, was tempted and tried even more fiercely, yet "without sin" (Heb. iv. 15), to become our pattern and model in sin-resisting, Satan-conquering.

Thus the entire entity of Man, and not only the body but also the invaluable soul, are God-derived and Heaven-sustained. For while the body was created by Jehovah (Gen. i.

27), He is also its life (Ps. ciii. 4); its preserver (Ps. xxxi. 23); its health (Ps. xlii. 11); strength (2 Sam. xxii. 40); keeper from disease (1 Thess. v. 23); preserver from death (Prov. xxiv. 11); bestower of long life (Ps. xxxvi. 9); and also to aid these, the Giver and Instructor of the hygiene best fitted to carry the body through life and enable it to fulfil its individual life rôle. So is it with the soul; God is also its author (Gen. ii. 7); life-bestower (Gen. ii. 7); health-giver (Prov. iii. 22); strength (Ps. xviii. 1); keeper from disease (Ps. xviii. 1); preserver from death (Ps. cxix. 175); bestower of an eternal existence (Ps. xxxv. 3); and also the giver of the priceless health system which best suits it, and enables it to live through this probationary world, receive its earth education, and fulfil its mundane duty. Thus it is that we individually, though often unaware of the fact, live *through* Him and *by* Him. His supreme desire towards us is that we should also live *for* Him and *in* Him. To effect this He has manifested and is still manifesting His affection for and care of us in a myriad ways, with a view to attain His great and ulterior object by the mightiest of all attractive forces, Divine love. Not one of the least important modes of attaining this vital end is the beneficent bequest of this superb hygienic system for humanity; the copestone and principal part of which is the soul sanitation we have now been considering: by which humanity keeps in touch with Heaven, and the soul communes with its Maker and its Saviour.

The world is merely a temporary home and school for human kind; the body an abode for individual souls: God being their legitimate teacher and the Holy Scriptures their authorized hand-book. The aim of their education is to develop the soul for God's service. It is well if we follow our Divine guide and guide-book: the only true and safe ones in all that concern our highest and best interests and those of our supernal nature, the soul. And well to cultivate the innate religious or reverential feeling in the soul, as one of the great beneficent forces in Nature, specially directed, among other objects, to please and thank the Author of Nature, Jehovah, for His love, patience, and forgiveness of sinful humanity: and to train and develop the errant but repentant and willing for that countless community, God's Kingdom, the chief conditions of whose membership are holiness, purity, love, and a likeness to Christ.

Facts are as important and necessary in spiritual as in other departments of hygiene. We must take the world and humankind as we find them; not as they ought to be, and as we would desire them to be. It is better to open our eyes to human imperfection, as the best and speediest way to meet and

remedy it. The race is full of sin; sinners are far more numerous than saints among men; evil allurements prevail over those of Godliness; we are prone to sin. Mankind may be divided into two great classes, Christians and sinners; and the former again into real and nominal Christians. Moreover, among all classes there are various grades of sin and sinners. The infant has only the stain of inherited indwelling sin. As years increase and contact with the world deepens, self-originated sin is superadded according to our individual tendencies and environment. But all born into the world are sinners (Rom. iii. 23), and require redemption, even the infant, with fresh and unstained conscience and a soul free from original sin. The child with awakened thinking powers and the adult, moreover, require *conversion*: the new birth to initiate them into God's Kingdom and enable them to begin a new life, that of Godliness. This transformation is the work of God's Holy Spirit, which seems to go where it listeth (John iii. 8), but no doubt only where God-directed (Ps. xxxiv. 22). Thus the Kingdom of God is begun in the human heart; "the kingdom which is within you" (Luke xvii. 21); which is "at hand" (Mark i. 15); is awakened by that Divine entity which "cometh without observation" (Luke xvii. 20); and thus silently, yet suddenly, a mighty and powerful work of soul revolution that humanity could never accomplish is effected, like all Jehovah does, without effort and with the greatest ease (John iii. 8).

For humankind to study what the Deity has intentionally and educationally revealed in His Holy Scriptures regarding the soul, that is ourselves; does not come into the category of prying into forbidden and hidden mysteries (Mat. xiii. 11); but is a plain and imperative duty incumbent on all. Moreover, a certain acquaintance and study like this of this momentous subject and the changes induced in the human soul and on Man's mundane life thereby, is absolutely necessary as a preliminary to our carrying out God's system of hygiene revealed in the Bible; and the surrounding of our spiritual entity with the sanitary environment best adapted for the furtherance of its earthly and eternal welfare.

Much of what occurs to the human soul in this its new and spiritual life; and the nature of that newly initiated vitality is hard for our earthly minds to comprehend; debarred as we so much are from the study of spiritual entities, forces, and laws. Meanwhile we can only try to understand what we as yet only see as "through a glass darkly" (1 Cor. xiii. 12). Conversion, the term by which the mysterious change effected in a human being who ceases to be a child of the world and becomes a Christian or Child of God; and its results on the individual, by

which his whole being, heart, mind, social and personal life and conversation are re-modelled and changed, and he becomes a "new creature," and is admitted into the family of God and Kingdom of Christ; has already been spoken of. As God implants the germ of biological life in the embryo body, so He now implants His spirit or spiritual life in the embryo soul. Formerly dead spiritually he is now alive, and awakes a "new creature" (2 Cor. xv. 7). At physical birth he was born of the flesh; now the twice-born soul is born of the spirit, into a new spiritual existence, to undergo slow evolution in Godliness, as a creature of eternity, in which it doth not yet appear what we shall be (1 John iii. 2) with Jesus Christ and His spirit in us, and our bodies the members of Christ (1 Cor. vi. 15). There is no spontaneous generation of soul or spiritual life any more than there is of biological life. All life, biological and spiritual, are special creations and of Divine origin. Neither man nor matter can originate them.

One thing is certain; that the entity called a human soul, whatever its structure, is plastic, teachable, capable of undergoing the mysterious process called conversion; of being born again and undergoing the second or spiritual birth; educated in Godliness; and moulded so as to be capable of changing its opinions and ideas regarding good and evil; and of accepting or rejecting God's service or Satan's, as these are offered or met with. The unconverted soul is spiritually lifeless till He who is "the life" (John xiv. 6) animates and starts its new being, in which Christ now "dwells in us" (1 John iv. 12); for know ye not your own selves how that Jesus Christ is in you (Rom. viii. 10). Our further aim and education should be to prevent sin and Satan from getting a foothold in our entity. The soul is the plastic protoplasm or clay; and God, in whose hands the soul has now placed itself, the moulding potter who develops it after God's spiritual laws of Nature, especially that of conformity to type or heredity. The new-born soul or spiritual man may be likened to an unformed and undifferentiated embryo, which has a glorious, though dimly, outlined future before it; although here it doth not yet appear what we shall be, but only know that we shall be like Him and shall see Him as He is (Job xix. 26; Mat. v. 8). The new-born soul thus clearly possesses new faculties and aspirations which enable it to ultimately correspond with the Divine. Having the Divine life necessitates a new and Divine environment, fitting it to attain somewhat towards the infinite complexity, sensibility, and attributes of Divinity; and thus occupy a higher plane than our pristine level when only a "little lower than the Angels" (Heb. ii 7-9).

"That which is born of the flesh is flesh, that which is born

of the spirit is spirit" (John iii. 6). A spirit hath not flesh and bones (Luke xxiv. 39). Humanity cannot judge of the latter by the former. The two entities and their ruling forces and laws are totally distinct. Nor is the spirit of Man like that of the beast; but of a higher nature (Eccles. iii. 21). The body is subject to biological law, which we may study, and to a certain extent control. The soul is a spirit and therefore subject to spiritual laws, which in our present life are nearly altogether beyond our ken or influence. Unlike the body, the soul is born anew, a second time, is born again into a new life in Christ (Rom. vi. 4), in which it leads a totally different existence, has very different aspirations and desires. This is the higher or spiritual life, which requires a totally different environment. All who would be "saved" and thus have their souls eternally happy, must undergo "conversion" and walk according to this new pattern in which the heart takes a prominent part. None are exempt, even nominal Christians, or the most innocent, and sin free. No mortal can enter Heaven with the same unchanged soul with which he began his earthly career. For this result every soul must be "born again" and commence a new spiritual existence. As already said, this change in the soul life is both sudden and complete. It affects the whole soul, nay, the whole life and entire being. The individual becomes, seems, and is a "new creature." Nor does the being remain stationary. In this, as in the body, there is constant increase in stature and strength until full maturity is reached (Eph. iv. 13). But there is no ageing or decline in vigour as years go by: and the saved soul's age dates from its conversion, not from its body installation.

Certain conditions are necessary for the inception of this new, spiritual, or second birth of the soul. Thus for all arrived at the thinking and judging age:—

a A personal desire for a new life is necessary in most cases; arising either from:—

1. Fear; the individual conscience having been awakened by God's grace to the guilt and enormity of sin: or—
2. Love and gratitude; the spiritual eyes and conscience having been awakened to the beauty and benefits of Holiness (Ps. cx. 3).

This, however, clearly cannot hold good in infant life, previous to the development of the reasoning powers. Can we doubt that then their Divine Father, acting as their infant-soul guardian, selects the most loving, best, purest, and sin-free of these immature souls before they know to refuse evil (Is. vii. 16), for development in the purer and safer air of Heaven, under His own eye, and

after His own methods. Moreover, even in adults, conversion may occur even when least expected and desired. Jehovah sees good points, even in wicked people; and knows best who will best suit His purposes when converted. In all cases the change effected in the soul and soul-life is more or less sudden (Acts ii. 2; Mat. ix. 24; John xi. 27; John xii. 11; John xx. 8; Acts iv. 4; Acts xi. 21; Acts xiv. 1); and silent (John iii. 8); and not controlled by Man but by God (John iii. 8).

b A child-like spirit is necessary for conversion and entrance into the spiritual kingdom; a spirit combining implicit, unwavering and increasing obedience, innocency, plasticity, trust, and love; a spirit of profound and utter helplessness and dependency on God. Jesus said "except ye turn and become as little children ye shall in no wise enter into the kingdom of heaven" (Mat. xviii. 3). It does not require maturity of mind to awake the soul to feel its true relationship to God and Heaven, return the love that comes from thence, and accept the Divine rest and peace which God sends into the believing heart; or to grasp the great facts of Godliness and grace which may be revealed even to the immature intellect of babes and sucklings (Mat. xi. 25; Luke x. 21; Ps. viii. 2; Mat. xxi. 16; see also Mark x. 15; Luke xviii. 17; 1 Pet. ii. 2; 1 Cor. iii. 1). Once begun the soul Godliness should grow until the spiritual intellect is mature (Eph. iv. 13). This right spirit once renewed or begun within the soul (Ps. li. 10) necessarily requires the suitable, healthy, spiritual environment, that which God suggests in His Holy Scriptures for its continuance and development. For though no mortal can keep his own soul (Ps. xxii. 29) we may sin against it (Prov. xx. 2); wrong it (Prov. viii. 36); or even destroy it (Prov. vi. 32) by mismanagement and neglect of its hygienic care.

c God's acquiescence and aid are necessary to endorse and initiate the soul's desire for conversion; to follow it up and perfect it. It is Jehovah that sends the "comforter" (John xv. 26; xvi. 7). It is with all the converted as with the disciples; "ye have not chosen me, I have chosen you out of the world" (John xv. 16-19). It is the Holy Spirit that opens the understanding to "spiritually discern" the truths of religion (1 Cor. ii. 14); that opens the eyes to see (Luke ii. 30); ears to hear (Ps. xl. 6); hearts to receive (Ps. lxxxiv. 2);

minds to know (Rom. xii. 2; Heb. viii. 10); and tongue to speak righteousness (Ps. cxix. 172). It is the spirit of God (1 Cor. ii. 12) that awakes the spirit of Man (1 Cor. ii. 11); and enables it to know "what is the mind of the spirit" (Rom. viii. 27): that feeds the believer with spiritual meat (1 Cor. x. 3); milk for babes (Heb. v. 13), and strong meat for them of full age (Heb. v. 14); that supplies spiritual drink (1 Cor. x. 4); spiritual gifts (1 Cor. xiv. 1); spiritual understanding (Col. i. 9); prevents spiritual wickedness (Ephes. vi. 12); and ministers to our general spiritual necessities, hygienic and otherwise; to enable the soul, spiritualized thus in this life, to grow in grace and strength, though still pent in an earthly body, not spiritualized till after death (1 Cor. xv. 44). With sighs, tears, and groans we may desire, seek, and pray sincerely for conversion unavailingly; till God sends it in His own good time and method. Or it may come suddenly, as with Saul (Acts ix. 3), when unforseen, uninvited, and least expected by some one whom the Divinity, who sees not as we do, knows will best suit His Divine purpose; or most deserves this special act of grace.

d Conversion cannot be bought, either directly from God or indirectly through Man. Like salvation, it is a free gift and from God (Ps. lxii. 1); who gives not the spirit by measure (John iii. 34). Nor do we know what is the way of the spirit (Eccles xi. 5). But it is not especially the rich or the great ones of this world that receive it, but often the poor. For "did not God choose them that are poor as to the world to be rich in faith and heirs of the kingdom which He promised to them that love Him" (James ii. 5). Nor is it bestowed on the learned, even in theology. Even the little child or the unlettered pauper, gifted with spiritually opened eyes, may instruct the most mentally erudite in matters of grace and Godliness.

The second, spiritual, or new birth having occurred; and the new and true Christian life having begun, the primary result and initial changes thereby started in the soul proceed: by the aid of the same agency which effected the change, the Holy Spirit. These spiritual changes our material senses cannot follow or trace, save by their results. The converted and awakened soul has now a new nature, is a new creature, has a new and Divine possession, and has begun a new and changed life "He that hath life hath the Son" (John v. 26); and "he that hath the Son hath life," everlasting Christ-life (Luke xviii.

30). The spirit has now implanted life from and through Christ, as the initial germ of a future nobler being, whose glories and attributes we cannot now comprehend (1 Cor. xv. 54). The entire life, walk, and conversation are altered. The individual is dead to the world and alive in Christ (1 Cor. xv. 22). The heart and whole man are swayed by God's quickening spirit; he feels that he has really, and no longer as a vague dream, entered a new kingdom, that of God, and on an eternal existence; his eyes are opened to the true aim of life; his relation to God, his fellow creatures, and the world. Under these new and favouring conditions spiritual growth begins in the soul. The believer, though perhaps old in years, begins to "grow in grace" (2 Pet. iii. 18); in purity, holiness, love, and wisdom, by constant contact with and inibibition of these in their fullest perfection (Eph. iii. 17). This growth is not of blood (John i. 13), but of God, and the spirit (John iii. 5). Its progress from the child to the full stature in Christ, by constant soul evolution, proceeds according to spiritual laws, according as he cultivates a correspondence to the likeness of our Divine model (Heb. iv. 15), and pattern in spiritual as well as earthly things. As a new creature he has now the "mind of Christ" (1 Cor. ii. 16), a "perfect heart" (1 Kings viii. 61), and strives hard to be like Him, to follow in His footsteps, do His will; strives to be pure, holy, harmless, undefiled, and separate from sinners (Heb. vii. 26); walks not after the flesh but after the spirit (Rom. viii. 1); the soul or spirit is now controlled by God, whom we now serve "with our spirit" (Rom. i. 9); the new spirit put in us at our second birth (Ezek. xi. 19); a new heart and new spirit combined (Ezek. xviii. 31). The being and the life he leads are both "new." We strive to have a conscience void of offence towards God and Man (Acts xxiv. 16); and strictly strive to obey Christ's summary of the law by loving God and our fellow creatures (Mat. v. 43): and proving discipleship by obeying His commandments, which are no longer grievous (1 John v. 3), because we are not now animated by the spirit of bondage (Rom. viii. 15); or error (1 John iv. 6); or antichrist (Rom. viii. 9); but by the spirit of adoption (Rom. viii. 15); that of truth (1 John iv. 6); of glory (1 Pet. iv. 14); of grace (Heb. x. 29); of Christ (Rom. viii. 9); and God (Rom. viii. 9-14); subdued by the Holy Spirit we are still God's "little children" (1 John iv. 4; 1 John v. 21); and act lovingly and obediently as such. We are still "babes," begotten of God (1 John v. 18); according to spiritual biological law; and so changed into the same image from glory to glory (2 Cor. iii. 18). Whom He did foreknow, He did also predestinate to be conformed to the image of His Son (Rom. viii. 29). Born again, our new anxiety is not so much for the body as for the soul, whose value we now realize. We

strive to develop the "new creature" according to the Biblical Jehovistic laws of hygiene; to train our awakened spiritual senses, intellect, and eyes to see God; our ears to know His voice and obey Him; our faith by which we feel Him and receive virtue even out of the hem of His garment; our taste to hunger and thirst after good and God, after His purity and His love; our talent for holiness, which fills the soul and illuminates creation with God; our faculty for love for the God who begets and longs to have it returned, and helps to make it grow in conformity to the type.

The ultimate result of this spiritual evolution of the human soul is attained and we grow in grace not by our "taking thought" (Luke xii. 25) or by trying to add one cubit to our spiritual or bodily stature. The end is perfection; the attainment of the Christ-like mind, character and life. We strive to be a "Christ" like Him; and transformed into His image even here; though for the completion of the change time is too short and eternity necessary. An invariable sequel of the change is a desire on the part of the Christian to extend Christ's kingdom and the type; to win others beset in life's hard struggle to share in the benefits and blessings; to have the whole race to participate; to further the unity of man and man in this Christ-like likeness, aim, and work; to reconcile God and Man; unite God and Christ and Man, till all mankind shall once more, as in Adamic Edenic times, be "one family" (John xvii. 11). What earthly science, philosophy, or philanthropy can for a moment be compared for splendour, comprehensiveness, and beneficence to this the Divine, in its ideas and outlook for Man's future, the future of the human soul; or what hygiene can rival the Divine for the attainment of this mighty end; the reclamation of an entire race from soul disease.

Thus the Kingdom of God is begun and carried on in the human heart. But the growth of spiritual life in the soul is a work of time. Soul evolution, which ends in admission to eternity, to which Christ's sacrifice gave an open door, is not accomplished at once; but varies in progress with individuals. It is for Man himself to second God's efforts by striving to develop the new life now begun by God's grace, by studying and striving for conformity to our Divine pattern-life, and also His spiritual hygiene, so fully and clearly set forth for us in the Holy Scriptures.

The newly-awakened soul clearly requires and instinctively seeks a different regimen and hygiene from the unawakened entity. And as a spiritual and not a physical entity it requires a different regimen and hygienic environment than the body. The conditions of life necessary for this change in the spiritual existence, from the old to the new, are different from those that

sufficed for the dormant, sin-inclined, evil-doing, or unconverted soul. This new environment God has beneficently outlined, and has promised His aid in its furtherance; with a view to enable Man henceforth to keep "himself unspotted from the world" (Jas. i. 27), and earthly sin defilement. The Christian now stands and lives on a more elevated plane; is animated by new, strange, but pleasing conditions of being; has new and previously unknown endowments. The changed life includes no special change in the physical environment; in his ordinary food, drink, air, &c. His body hygiene is unaltered, but not so his spiritual environment. The factors in this are fundamentally altered. The Christian, courts, seeks and finds different food, drink, atmosphere, companionship, literature, and so forth, as already spoken of, and so feels, is, and acts as an entirely different and "new creature." The spiritual hygiene of the Holy Scriptures, Man's sole source of instruction and advice in spiritual matters, is meant to appeal to the conscience and judgment of the human entity during its entire career; if not from the moment of its first or earthly birth, at least from the advent of its thinking and reasoning powers; and will be or ought to be especially appreciated and studied by the awakened soul after its second or spiritual birth and conversion: because then its full truth, value, efficacy, and comprehensiveness will most appear to the spirit-opened eyes of the human understanding and the spiritually enlarged mind.

No human being can make himself a Christian, but he can aid. The Christian is born, not made; the soul becomes regenerated, a new creature, a new man, not by spontaneous growth, but God's will and initiation. So it requires His aid to help the soul to grow and to give it the sustenance, Christ, on which it feeds, to be built up, and add cubits to its stature by and according to laws of spiritual physiology, corresponding largely to those of physical or biological life. The one kind of life, and the process as mysterious, secret, and invisible as the other; but both, and especially the spiritual life and growth, arranged and manipulated, and the change into Christ's image effected, not by Man's will or agency, but by God's. Whence or when this comes, whither it goeth, or how fast will be the advance and growth, depends on Divine agency; God working in us, His own property, to will and to do of His own good pleasure (Phil. ii. 13). We are created in Christ Jesus unto good works (Eph. ii. 10), which God hath before ordained that we should walk in them (1 Pet. ii. 12). It is God which begins the elevating and sanctifying process; and God which "giveth the increase" (1 Cor. iii. 6). The Christian's duty is to acquiesce, aid, and "be still and know" that it is God that is effecting his rescue. He has only to abide in Christ and allow His spirit to

tend, water, feed, and nurse the mysterious process involved in the soul's spiritual growth and development.

Jehovah will not aid an unwilling rebellious soul. As a rule He begins the process by bringing our ideas and will into harmony with His, and enabling us to see the necessity for and benefits of the change and His help in attaining it. Each soul must "work out its own salvation with fear and trembling" (Phil. ii. 12); with fear for its momentous issues; with trembling lest death should prevent us. And in order to further our evident duty each must endeavour to give his soul a proper environment and judicious hygienic surroundings, after Jehovah's own model laws and suggestions in the Holy Scriptures; laws not meant for the laity alone, but for all; and also for priests, who are merely human beings set apart by selection or choice for God's special service, the inculcation of Godliness and elucidation of God's Word. This is especially emphasized by the Mosaic Law. Thus Levit. xxi. is a special chapter for the spiritual, moral, and social conduct of the Hebrew priests and their families. This inculcated scrupulous soul and body hygiene, both for their own sakes; as an example to their lay neighbours and the camp, and above all as individuals set apart to God's service, who therefore should be especially obedient to His laws. Jehovah ordained that His priests should be particularly free from personal, surgical, medical, and physiological blemish. There is no teaching so potent as that of a good example set by prominent educated people, such as priests; and teaching in spiritual matters should be more than usually perfect; especially in the near presence of bad example, so dangerous in every grade of life. It was usual for the priests of some heathen deities of that day to maim themselves disgracefully. Imitation of this by the Hebrew priests would have led to imitation by the people. For the Hebrew congregation Lev. xix. and xx. are chapters wholly given under the heading of various laws to rules for governing soul and heart, that is spiritual, moral, and social purity and hygiene. And it is worth recollection and a suggestive hint for modern times that while nothing is more carefully inculcated in the Mosaic law than the duty of parents to teach their children its precepts and principles (Ex. xii. 26; xiii. 8; Deut. iv. 59; lxii. 7-20; xi. 19-21), the wisdom and instruction is to be chiefly understood as that of moral and religious discipline, imparted according to the discretion of the law, by the teaching, and above all the example of parents. There is little trace among the early Hebrews of education in any other subjects. Religion and morality were paramount. And it is chiefly of this form of instruction that the Proverbs speak so much and praise so highly (Prov. i. 28; ii. 26). The great object of this education of Hebrew youth

was evidently to develop the innate religious instinct in the soul protoplasm, aid its culture, make it grow after its God-aided and Heaven-implanted natural tendency to develop, in the proper direction. The New Testament throughout teems with similar advice regarding the religious tuition of the young, the adults of the future. The entire text of the Holy Scriptures throughout indicates in many ways, direct and indirect, that soul culture and soul evolution in Godliness should be the great aim of the life of every human being: and the chief object in our individual efforts.

Nor in following out this scheme of soul hygiene and striving to obey its dictates implicitly, is it necessary or binding or indeed wise to forsake the world and seclude ourselves from our fellow creatures, any more now than it was in Mosaic times. The human soul is very much alike everywhere and in all periods. Its healthy aspirations can be fostered and its morbid ones combated everywhere with corresponding facility. The Jehovistic hygiene was framed for the men and women of the busy world, and not for the recluse and the solitary. We may and can fight sin while doing our usual worldly work, as well and easily as anywhere else, if we try and ask God's aid.

The main factors in spiritual hygiene formerly spoken of are all necessary for perfect soul health and vigour. The wise and the Godly will attend to them all, and make the pursuit the chief business of his life, even to the detriment of his mere worldly interests. Attention to one alone will not suffice. The true Christian strives to follow one and all of God's commands; as representing his own interests; for all are imperative. Nor does he neglect God's proffered aid (Ps. lxxxi. 7); and Christ's (John vi. 37); recognising the frequent futility of his own unaided efforts. Nor does He forget the constant necessity for Godliness in all we think, say, and do: above all his public and private Christian duties, such as public worship, communion, the proper selection of their books, companions, and studies, and His own; striving for such as will minister to the soul's spiritual wants, comfort, and interests. The germs of healthy spiritual life will thus be silently and imperceptibly sown; to sooner or later blossom and bear fruit in the evidences of works and faith in well-balanced, deeply-rooted, Christian lives: lives in which the health hygiene of the soul has been the main factor, and constant, strict attention to God's spiritual laws, the leading feature; no matter how the world may judge, or what our fellow men may think; the chief desire being to please God, more than to court the praise of humanity (John xii. 43). Opinions may differ as to the relative importance of these different hygienic soul factors; and different persons and creeds may deem some more important than others. Spiritual life is the

sum total of the effect of the functions which resist sin; and spiritual hygiene the sum total of the factors which influence the spiritual life for good or evil. The soul's atmosphere or environment is the difference between the trials and allurements of the world, and the opposing benefits and blessings of Godliness. The Holy Scriptures mention and illustrate matters relating to human hygiene, according to their importance. They speak far more of moral than they do of intellectual hygiene; and far more of spiritual hygiene than of either. Nay, far more even than they counsel regarding that very important subject, body hygiene. The soul; its past, present, and future; its relation to the individual, his fellows, and Maker; its fallen state, sinful, unhealthy condition; the best mode of lessening or cancelling this by our own efforts, aided by God's advice and help; and Christ's atonement, the *sine qua non*, form the chief theme of the Holy Scriptures, from the loss of Paradise detailed in Genesis, to its promised regainment pictured in the Apocalypse. Where can we find philosophy in ancient or modern times to equal in tone, wisdom, purity, and comprehensiveness that found in the Holy Scriptures for the hygiene, health and happiness of the human soul? Or where can we find spiritual philosophy so ennobling, far-reaching, and beneficent as that of Jehovah?

In all matters relating to human health the two-fold nature and double entity of Man must never be forgotten. Both his soul and his body hygiene have to be studied and legislated for. And no system of hygiene can lay any claim to completeness unless it aims at something more than the mere preservation of the physical or body health. Jehovah has shewn many centuries since that it is not only necessary to maintain the proper mental, moral, social, and, above all, the spiritual health and vigour; and that this is the chief part of all hygiene. Body, mental, moral, and spiritual, health stand to each other in an increasing ratio of importance; the last being the most vital of the four; because it is of eternal, while the former are only of temporal import. And yet they are all very closely intertwined, allied, and interdependent in actual life, although so totally distinct. The welfare of the soul is of paramount importance (Mat. xvi. 26; 3 John ii. 3). Its environment and the factors which affect it; its condition, for good or for evil, surroundings, choice of teaching, companions, studies and books are of the highest hygienic import. Next in import to the soul's health and hygiene are those of our moral nature (Prov. iv. 23; Mat. xv. 11; Jas. iii. 5-6). The value of our body health and hygiene, with which our mental health is so closely incorporated, need not be further urged. But still these are all closely interdependent and correlated, so that they mutually act and re-act

on one another, and so cannot be altogether disassociated in practice or studied separately. This is universally recognised. Man's religious tendencies are much affected, for good or for evil, by the condition both of his mind on the one hand, and of his body on the other. So also mental obliquity, psychical and moral, originating in the promptings of original or acquired sin; in other words, mental and moral alienation, in their numerous forms and varied grades, not amounting exactly to insanity, no doubt interfere with the soul's health and vigour, or are apt to do so. The more we check these the higher, cæteris paribus, are our religious aims and aspirations likely to be; while the opposite equally holds good. Our moral nature is largely controlled by our heavenly aims. The close relation which exists between Man's spiritual and moral nature on the one hand, and his physical health on the other, furnishes further food for reflection from a hygienic standpoint. Unhappiness, whether from spiritual or moral causes, materially affects the bodily health. And so, vice versa, bodily ailments, except those specially inflicted, permitted, and sanctified for our good, are apt to influence our moral and spiritual standing. Unquestionably the soul or real ego is largely modified and moulded by and through the casket which contains it. Its health hinges considerably on that of the mind and that of the body. Clearly, therefore, we should strive to maintain our mental, moral, and physical health, not only for the sake of the body and our spiritual happiness and welfare, but also and chiefly for our eternal interests, those of our real self and better part. Every exercise performed by the mind and the brain implies and includes an expenditure of cerebral tissue. But, unlike other body tissues, the cells and fibres of the brain are permanently impressed and stamped with every act performed or thought generated, thus leaving a record for memory to treasure and summon at will. How important, therefore, not only for our moral but also for our spiritual welfare, it is that we should keep that most important organ, the brain, and its appended nervous system, in the highest health, sound and strong.

In accord with Man's complex nature the Scriptural hints and maxims and laws on the subject of hygiene and health are thus of a multiple nature. Some are given to promote the welfare and spiritual culture of the soul. Others are given to aid in preserving our moral equilibrium. While others aim at aiding our mental; and others our physical health. Hence the corporeal or physical hygiene of the Sacred Book cannot be disassociated from the moral and spiritual hygiene, because they are inseparably blent; many of both kind of hints having unmistakeably a multiple aim: and while apparently directed to

one object they have an indirect application of undoubted meaning and importance towards one or other or both of the others. In Man, physical, vital, and spiritual entities, forces, and laws commingle. Spiritual ones exist in the world and in Man as well as in what we and the Holy Scriptures term Heaven. The soul which came from Heaven to inhabit the vitalized abode, workshop, or machine called the body, brings the atmosphere and possibilities of Heaven with it; and gives every individual born a chance of making earth his own entity, and somewhat resemble the Heaven of the after-death, to which we would all fain go.

The most prominent fact which meets us in studying Bible hygiene, and especially that of the soul, is: that disease, according to the sacred narrative, has its source in, and is one of the Heaven-appointed temporal punishments for the rebellion and sin into which Man fell by his own folly. And, as this affects both parts of our double nature, it necessarily consists of two kinds, viz., soul or spiritual disease, and body or physical sickness; which may lead to spiritual or physical death. Sin in its many different forms is only a variety of mental, moral, spiritual, or corporeal aberration; even as its results are merely departures from spiritual, mental, moral, or physical health, induced by broken spiritual, moral, mental, or physiological laws.

The Divine scheme of Redemption, planned to counteract the individual and collective effects of sin, is partly *curative* in its aim and action; because meant to bring transgressors against God's spiritual, moral, mental, and physiological laws back to obedience, and their former state of spiritual purity, moral innocence, mental and physical health: and also and mainly *hygienic* and devised to prevent such as have erred and broken any of these codes from falling again or permanently into the toils of sin and its consequences. Nay, does not the beneficent plan include the still higher aim of preventing and curing not only the consequences of sin, that is spiritual, moral, and physical disease and death, but also of eradicating the greater pathological agent and disease, sin itself, by a gradual process, which includes:—

1st. A voluntary (John vi. 44; xii. 32); or compulsory (Ez. xxii. 20; Deut. xxxii. 16); looking unto Jesus (Heb. xii. 2); that is, believing in, accepting, and receiving Him as our Saviour.

2nd. Pardon through this faith in Him (Ephes. ii. 8; 1 Pet. i. 5).

3rd. Love to God, thereby originated and developed (1 John iv. 19).

4th. Obedience to Him and His word and laws, as a necessary result (Ps. xl. 8; Rev. xvii. 17; John vii. 17; 1 John ii. 17).

5th. A proper knowledge of His laws, derived from a close study of His Holy Scriptures; and especially of those parts devoted to the exposition of His Divine hygiene for the individual and the race; the sanitary science of the sacred Scriptures, spiritual, moral, mental, social, and corporeal.

As sin is, and probably ever will be while time lasts, ever present and constantly assailing us, even the regenerate; the above also includes a process of Heaven-aided and God-directed self-help and self-cure on the part of our erring race; effected by an appeal to conscience and love, and by a willing return to the desired spiritual, moral, and corporeal health, even as the primary departure therefrom in Eden was voluntary. Spontaneous love, service, and submission to His laws, through faith in the expiatory sacrifice of the cross being what God longs for as much from fallen Man now as He formerly desired, a willing obedience from the primeval pair in the days of their innocency.

Viewed thus, are not the spiritual, like the moral and corporeal health laws of the Holy Scriptures, both in their observance and in their breach, calculated to have both a health-preserving and a health-bringing, in other words, a combined hygienic and curative influence? As part of the Mosaic Code, and therefore "schoolmasters to bring us to Christ" (Gal. iii. 24), are not all of these Biblical health codes beneficent in their grand ultimate effect; and meant to teach mankind by the experience of life, whether it is better to follow our own will in spiritual, moral, and corporeal health matters, and suffer frequently therefrom; or to obey God and the hygienic laws He has made for and divulged to us, with child-like trust; and thus escape the double penalty sure to follow both Nature's broken health laws and disobedience to the Creator.

Indeed, is not the entire Bible mainly a code of spiritual and moral hygiene, with which the minor but allied subject of body hygiene has been intimately incorporated, but yet not accidentally, but intentionally and educationally, to indicate their interdependence and mutual relation? Is not the main aim and object of the Sacred Book to bring back our fallen race from a state of sin, misery, impurity, spiritual disease, and death, to one of spiritual health, vigour, life, happiness and purity? To restore the souls of men, in some measure at least, to the pristine innocency of that of their first progenitor, Adam? And to point out in various ways, by proverbs, parables, warnings, biographies, histories, and laws, &c., the different sources and kinds of spiritual disease; and also the different modes in which these may be opposed by *preventive* soul hygiene;

and also the various methods by which their evil effects may be counteracted and remedied by *restorative* soul hygiene, by both of which methods Man's immortal part, the soul, may be brought back to pristine purity and health, and again possess somewhat of its original innocency and its former hearty and spontaneous allegiance to and dependence on its Divine Author.

The spiritual hygiene we have now been studying, as by far the most important section of human sanitation, may be divided, like its other departments, into personal and public. The former consists of that which deals with the individual alone; and in which, though outer agencies and persons have often a material influence, as secondary agents, the main factor in the process of preserving the spiritual health or restoring it by hygienic measures, is the individual himself: and the other, public spiritual sanitation, in which the masses are acted on by the same agencies.

This imperfect and brief review of the spiritual hygiene of the Holy Scriptures and of Jehovah's rules and regimen for Man's religious training, and the education which forms by far the most important part of our earthly education, and embraces the study of the "life of God in the soul of Man"; goes far to shew that the sum of the Bible teaching closely accords with worldly experience in attesting that the only way to be, if not permanently and perfectly free from care, at least to enjoy the greatest share of happiness that this world permits, is to be perfectly pure, honest, truthful, and God-fearing. A consecrated hearty obedience to God's spiritual laws is assuredly the most certain way to induce lasting and true happiness. Just as the steady and close fulfilment of the sanitary maxims for the body health is the most likely way to preserve our physical efficiency and vigour. The "fear of God is the beginning of wisdom" (Ps. cxi. 10), for its leads us to study His Book who is the fount of wisdom and sanitary knowledge; and thus to love and obey Him. "For this is the love of God that we keep His commandments, and His commandments are not grievous" (1 John v. 3). We love and obey both therefore. Whosoever therefore fears and loves His maker as he ought should use every endeavour to preserve his health, taking the word in its widest sense, physical, moral, mental, and spiritual. Above all he should specially study the latter, not only because it is personally precious, but also because it is invaluable, as enabling each to perform His own Heaven-allotted part in His great earthly plan, and in His still more stupendous scheme of creation; therein to do our duty to ourselves, our fellow creatures, and to our Maker; and fulfil the rôle, great or small, for which each of us was sent into the world. As already seen, and with a view to help us to satisfactorily attain this all-important object,

Jehovah, by means of His revealed word, lays down exactly such rules and directions and laws regarding these two intimately associated departments of human sanitation, namely, spiritual and moral hygiene; to follow which brings soul health, life and happiness; while to persistently disobey sooner or later induces misery, spiritual disease, and perchance death.

Moreover, although incumbent on all humanity to cultivate the mind and intellect as well as the affections; the head as well as the heart; the relative importance of these two in Jehovah's sight, and therefore in the Christian's eyes, may be gleaned from the Holy Scriptures; inasmuch as the emphasis with which the Scriptures say, "My son give me thy *heart*" (Prov. xxiii. 26); while the commanding intellect of the Supreme Wisdom is never spoken of, at least in laudatory terms, love and affection being deemed His highest attributes and excellence (Hos. xi. 4; 2 Cor. xiii. 11); proves that great, important and imperative though the cultivation of the mental powers is considered in God's sight (2 Tim. i. 7), the development of the heart, feelings, affections, and, above all, love, the highest faculty, emotion, and attribute of the human entity as it is of the Divinity, ought to be the chief object of our desire; especially as it forms the most important factor in the cultivation of the highest of all our earthly interests, the welfare of the immortal soul. "Keep thy *heart* with all diligence, for out of *it* are the issues of life or death" (Prov. iv. 23) is a Bible maxim which forcibly and clearly shews that constant care is as necessary in our spiritual as it is in our mental, moral, social, and physiologcal hygiene.

No matter who, where, or what he is, no human being can expect to escape the assaults of sin, a disease and a force ever present and active. Nor can any mortal always expect to successfully resist temptation, or to be so invincible to evil, as to be perfect (Rom. iii. 10). But He who was tempted and knows we are but dust (Job xxxiv. 15) will assuredly accept every strenuous and sincere endeavour to "overcome" (Rev. xxi. 7) its advances; and will pardon all shortcomings during such efforts for the attainment of that perfect purity (1 John iii. 3); and holiness (Lev. xi. 4-9); and closer resemblance to His likeness, to which all true Christians do and all mankind ought to aspire (Ps. xvii. 15; 1 John iii. 2). The Scriptures point out clearly and forcibly that there is one desire and feeling that Man need never check nor control, and that is *love to God*. This indeed is the only sentiment against over-indulgence in which we are not specially warned; and are only cautioned against nourishing too lightly (Deut. vi. 5). Nothing, not even our dearest and our best of Earth may we love too much or idolize (1 John v. 21); but Jehovah we are commanded, and it is our highest

wisdom to love "with *all* our heart and soul and mind and strength (Deut. x. 12; Mat. xxii. 37). For Him our affection ought to be supreme and boundless. The stronger it is, so much the more pleasing is it to Him, and so much the better for ourselves, not only for time but for eternity. The God whose greatest attribute is love longs most of all for our love. His chief desire is for our affection. This once attained by us: love once begotten in our hearts; admiration and trust in His laws follow (Ps. xvii. 9); then their study (Ps. i. 2); then their fulfilment; and most of all attention to that which most concerns every individual that comes into the world, namely, soul health and hygiene. This love of and for the Supreme Being, if not the basis, is at least the great motive power to develop Man's latent religious principle and instinct, the most important of all the sentiments by which mankind is swayed; that all important force on which life, both individual and general, is organised on the footing of freedom, order, and righteousness; one of the silent constructive agencies of Nature (usually the strongest and most efficacious of forces, and this one of the mightiest and most important of them all); a force which may change its attitude, but never its foundation; and which, in former days apologetic and defensive, is now boldly meeting new issues with new arguments. Love is the most potent motive force and governs not only the world but creation. Scripture not only inculcates the study and pursuit of love, but points to its evolution and educational development of our individual share, implanted by Divinity, as under God's tuition one of the greatest objects in life and worthy of our chiefest care. It is the basis of the religious instinct, both being implanted in and most important of the many and varied "talents" for which every human being will no doubt have to account at the final reckoning. Neither of them are myths but verities. Nor let any mortal deem religion, Godliness, or devoutness sentimental, maudlin, superstitious, effeminate, or foolishness, seeing that the Saviour's "manliness" was not more evident during His entire earthly career than was His obedience (Rom. v. 19), and His mighty love (1 John iv. 11). None but superhuman heroism could have courted and met the ordeal of crucifixion and the withdrawal of His Father's countenance (Mat. xxvii. 46), for so pre-eminently unselfish and forgiving a motive. From Christ downwards the martyrs' missionary and otherwise, for Divine truth have ever been the greatest heroes of the world, in the widest sense of the term. Nor is it only the credulous and the simple-minded who accept Christianity. For not only have the greatest Divines and theologians calmly and dispassionately investigated the Holy Scriptures and religious belief; but men of the highest intellect, philosophers and

scientists, like Newton and Brewster; and embraced both, fully convinced of their veracity and value as supplying a need which Man individually and racially lacks.

Nor, on the other hand, should saintliness be deemed allied with impaired and inconsistent with robust health. On the contrary, although sickness is not unfrequently a blessed and God-sent means of spiritual education and awakening, we are likely, other things being equal, to be most Godly and devout when we are in the best sanitary condition and the most robust health. Nor, once more, is the study and practice of religion inconsistent in any measure with worldly labour, work, or business, whether manual or intellectual; for business or pleasure. Nor is there either worldly necessity nor Divine law that inculcates or suggests seclusion from the world and our fellow-men, in order to promote personal or public religion; but quite the reverse.

After their emancipation, and during the Wanderings, the great aim of the Deity was not so much to make the Israelites intellectual and learned, as to make them obedient, loving, and religious. Hence the education of the soul, morals and heart were the chief objects of the many-coded Mosaic law. He legislates for them and us accordingly; anxious for our individual and racial love, He strove to shew how dependent we all are on Him, how much we owe to Him, and how great should be our gratitude.

When Moses lifted up the brazen serpent in the Wilderness for the relief and cure of the wounded serpent-bitten Israelites, He gave both them and all mankind of that period and the future a most monumental object lesson; by pointing out who is the real giver, sustainer, and restorer of life and health; the maker and custodian of health forces and laws; the maker and permitter of disease, forces and laws; and the author and aider of hygienic forces and conditions: and, above all, by shewing them and us to whom we are to look for soul and body health and healing, as an indispensable accessory to our own equally indispensable efforts. That momentous educational miracle not only taught the Hebrews practically that faith might have both an immediate physical reward in a speedy return to health, as well as a spiritual recompense in a renewal of God's favour; but also indicated the mode by which sin and its results might be avoided, by fully and closely following God's true spiritual, physical, and moral superintendence, and His spiritual, moral, and physical hygienic laws for human life, individual and communal. It pointed figuratively to the person and the work of the "great physician," by far the most eminent and potent of the great educators and benefactors of the world, who came for the "healing of the nations" (Rev. xxii. 2): who came not to

abrogate but to fulfil and enforce the complex, spiritual, moral, and physical hygienic code, long previously laid down at Jehovah's authorship and diction by His servant and forerunner Moses (Numb. xii. 7); and formulated by the clear intellect of Divinity, for the purpose not only of healing sinners but to prevent further sin and sin disease; by its sin-preventing and sin-curing efficacy. The brazen serpent above all was a type of the great Divine Healer, who subsequently came and took the Divine form and nature with a special view to give a practical and personal example by His life and conduct, how closely and beneficially all men could, if they would follow these commandments in their entirety, the hygienic ones included; and what the result would be, namely, a stainless life and healthy body, a comparatively long life instead of one of a few years, and the smile and approval of the "well-pleased" Father (Mat. xxv. 21); rewards one and all, as open to us as to our "elder brother" (Mark iii. 35), in whom, by whom, for and through whom are all things (Ephes. i. 22; 1 Cor. viii. 6); in, by, and through whom we "live, move, and have our being" (Acts xvii. 28); and among other benefits, individual, national, and racial aid and strength to help us to live as He did; and its sequel, the health, vigour, and happiness of the race, individually and collectively, for time and for eternity. Moreover, in the life eternal, which He has helped us on Earth to gain, may we not expect the eternal soul, made plastic for eternity as well as for time, to adapt itself to its new and strange supernal environment, which will be perfect, and in correspondence with that which is Divine, as our entity will also be like His, immortal, not mortal, but Divine: immortal in character as well as in longevity.

The study of the Jehovistic spiritual hygiene and the effort to follow its dictates will never, under God's guidance and help, be wasted or barren of results; but will bear abundant fruit in increased knowledge of spiritual matters; more perfect obedience to God and His laws, an increased insight into the breadth, depth, and value of these laws, and of His beneficence to Man in enlightening him by formulating them; His love in doing so much to promote soul health and hygiene; a more spiritual life and increased grace, peace, and love in the soul and in both the inner and the outer life; a decrease in worldliness and the earthly part of our nature; and an increase in its spiritual part (James iv. 6).

The hygiene of the human soul, as set forth in the Holy Scriptures, not only forms the most important, imperative, and momentous part of the hygiene of humanity, as legislated for by the incomparable and infallible Hygeist, Jehovah; but gives, more than all the rest of His comprehensive scheme, proof of the beneficence, care, and forethought for His errant offspring;

as well as of the priceless value, veracity, and credibility to them of His Holy Scriptures.

The great and ulterior aim of the Jehovistic scheme of human hygiene found in the Holy Scriptures; a scheme as complex as is Man himself; is to train and fit human beings for God's service here and hereafter. To effect this magnanimous and beneficent purpose it is chiefly necessary to educate and environ the soul suitably, so as to awaken, develop, and train its latent supernal affinities. This is the main purpose of God's manifold rules for soul hygiene. But in order to aid this development it is also necessary to have the full co-operation of other co-ordinant human faculties; which likewise require a suitable hygienic environment. Among these is the intellect for which Jehovah has divulged laws and maxims to promote healthy, moral, and intellectual mentation, and others to promote His social functions, Man being the most social of all the earthly creation. But, again, in order to carry out His beneficent educational scheme, it is also essentially necessary that Man's physical entities, his body and brain, which develop his intellectual, moral, and social instincts, and that lodge the immaterial soul, should be properly cared for sanitarily, to enable them to perform their duties satisfactorily. Another variety of environment and other sanitary conditions have thus been superadded. These different hygienic environments, the corporeal, mental, moral, social, are all, however, merely accessary and subsidiary to the major and more important, that for the soul, Man's real entity. The Divine sanitation, as set forth in the Holy Scriptures, thus legislates and codifies rules for the wisest and best sanitation of the whole Man. And it does this in a manner which cannot be surpassed or even equalled by Man himself. No human scheme of sanitation can for a moment compare with the Divine in depth, breadth, comprehensiveness, adaptability, suitability, and efficacy. Like all else that God undertakes, this is unapproachable, unequalled, and perfect. Some of it, for example the spiritual, it would be impossible for Man himself, without God's Bible to legislate for. Man lives, moves, and has his being in God; though too often all unaware of it. And, being thus informed, it is his plain wisdom and duty to own his allegiance and follow the beneficent advice which He reveals.

The great necessity which exists in all, even the Godliest, for a careful and constant pursuit and study of soul hygiene from birth to death, to supplement God's grace and His aid in the preservation of our soul's health, welfare, and life, and the means we may best employ to effect this momentous object, that ought to be the most important aim of every human being, is

well and forcibly, though figuratively, shewn by St. Paul; thus "Finally my brethren be strong in the Lord, and in the power of His might. Put on the whole armour of God that ye may be able to withstand in the evil day, and having done all to stand. Stand therefore, having your loins girt about with truth, and having on the breastplate of righteousness; and your feet shod with the preparation of the gospel of peace; above all, taking the shield of faith, wherewith ye shall be able to quench all the fiery darts of the wicked. And take the helmet of salvation, and the sword of the Spirit, which is the Word of God: praying always with all prayer and supplication in the spirit, and watching thereunto with all perseverance and supplication for all saints" (Ephes. vi. 10-19). No clearer definition of the spiritual conflict which all men have more or less to undergo in passing through this sin-steeped earth; and the "mystery of the gospel" given to instruct us how to act, could be given, because it is inspired. No study, scientific or philosophic, is more important, and no pursuit more interesting. For what is there in creation that can compare in value to mankind individually than themselves, their everlasting souls; or what system of education more important and imperative than that which has this as its copestone?

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